DEPARTMENT OF COMMERCE

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION

Washington, September 30, 1926—No. 114

CONTENTS

	Page
Abbreviations	1
New stations	2
Alterations and corrections	5
Miscellaneous:	
Changes in radio-beacon stations	9
Changes in foreign stations	9
New lists of radio stations available	9
Vessels equipped with a radiocompass	10
Free medical radio service rendered by the Tropical Radio Telegraph Co. and the United Fruit Co.	10
Miscellaneous—Continued.	
Lost commercial radio operators' licenses	11
Standard-frequency stations	11
Constant-frequency stations	12
Bibliography on radio wave phenomena and measurement of radio field intensities	13
Establishment of radio standards of frequency by the use of a harmonic amplifier	14
References to current radio literature	14

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 station.
FS = Fog signal.
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. C. = Independent Wireless Telegraph Co.
K. & C. = Kilbourne & Clark Manufacturing Co.
R. C. A. = Radio Corporation of America.
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.
V. t. = Vacuum tube.

13253°—26——1

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—
Balangiga, P. I. (Samar)[1]	KZBL	600, 755, 950	PG		Philippine insular government.
Cleveland, Ohio[2]	WCY	715, 875, 890, 1,600, 2,100, 2,400.	PG	N	R. C. A.
Cleveland, Ohio[3]	WTL	1,960	FX		Intercity Radio Telegraph Co.
Connellsville, Pa.[4]	WOB	90.85	FX	X	West Penn Power Co.
East Moriches, N. Y.[5]	WSA	600, 630	PG	N	I. W. T. Co.

[1] Loc. O 125° 23' 00" E., N 11° 06' 32"; range, 150; system, composite v. t. telegraph, c. w. and i. c. w.; hours, 8 a. m. -12 noon, 2-5.30 p. m. week days; 9-11 a. m. Sundays and holidays; ship service last 30 minutes of each hour; rates, ship service, 6 cents per word.
[2] Loc. (approximately) O 81° 46' 07", N 41° 28' 30"; range, 400; system, R. C. A., v. t. telegraph; rates ship service 10 cents (52 centimes) per word.
[3] Loc. (approximately) O 81° 41' 00", N 41° 30' 00"; range, 500; system, composite, v. t. telegraph; hours, 8 a. m. -8 p. m.
[4] Loc. O 79° 35' 45", N 40° 01' 42"; range, 200; system, composite v. t. telephone and telegraph.
[5] Loc. (approximately) O 72° 46' 05", N 40° 45' 00"; range, 500; system, composite, 1,000; rates, ship service 10 cents (52 centimes) per word.

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—
Albay[1]	KZAK	8	PG	X	Compania Maritima	Owner of vessel.
Colorodon	KGCS	8	PG	X	General Metal Supply Co.	
Eastern Crown	KUNQ	8	PG	X	C. H. Sprague & Son	R. C. A.
Fisherman[2]	KNT	8	PG	X	Zane Grey	Owner of vessel.
Honolulan[3]	KGCO	8	PG	X	General Metal Supply Co.	Do.
Lake Ellendale	KEPN				William Clifford	
Lemuel Burrows[4]	KLY	8	PG	X	Mystic S. S. Co.	R. C. A.
Petaluma[5]	KGCT		P	X	Petaluma & Santa Rosa Railway Co.	Edward J. Gabriel.
Pulilo[6]	KZCH	8	PG	X	Philippine insular government.	Owner of vessel.
Sea Rover[7]	KGCP	8	PG	X	Shipowners & Merchants Tugboat Co.	Do.
Sunoco	KGCQ	6	PG	X	Sun Oil Co.	
The Old Timer No. 3[8]	KGCV		P	X	O. E. Sovereign	Aladdin Co.
West Alsek[9]	KJUO	6	PG	X	U. S. S. B.	I. W. T. Co.

[1] Range, 150; system, composite, 120; w. l., 600.
[2] Range, 300; system, Marconi spark, 1,000, and composite v. t. telegraph; w. l., 108-130, 600, 700, 800, 875.
[3] Range, 300; system, Navy, 1,000; w. l., 600, 700, 800.
[4] Range, 300; system, R. C. A., 1,000; w. l., 600, 700, 800.
[5] Range, 25; system, composite v. t. telegraph; w. l., 40, 600.
[6] System, W. S. A. Co., 1,000; w. l., 300, 600, 800.
[7] Range, 150; system, Lowenstein, 1,000; w. l., 600, 700, 800.
[8] System, R. C. A. v. t. telegraph and telephone; w. l., 109, 600.
[9] Range, 300; system, Navy-K. & C., 1,000; w. l., 600, 700, 800.

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	
KEPN	Lake Ellendale	b	KNT	Fisherman	b
KGCO	Honolulan	b	KUNQ	Eastern Crown	b
KGCP	Sea Rover	b	KZAK	Albay	b
KGCQ	Sunoco	b	KZBL	Balangiga, P. I. (Samar)	c
KGCS	Colorodon	b	KZCH	Pollilo	b
KGCT	Petaluma	b	WCY	Cleveland, Ohio	c
KGCV	The Old Timer No. 3	b	WOB	Connellsville, Pa	c
KJUO	West Alsek	b	WSA	East Moriches, N. Y	c
KLY	Lemual Burrows	b	WTL	Cleveland, Ohio	c

Commercial airplane 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 length	Service	Hours	Station controlled by—
Unnamed	WKBK				Radio Club of Rochester.

Broadcasting stations, alphabetically, by names of States and cities

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

State and city	Call signal	State and city	Call signal
Arizona: Prescott	KPJM	New York:	
Idaho: Pocatello	KSEI	Brooklyn	WTRC
Illinois: Carthage	WCAZ	Newburgh	WKBM
Kansas: Concordia	KGCN	New York	WJUG
Michigan:		Do	WKBQ
Battle Creek	WKBP	North Dakota: Mandan	KGCU
Monroe	WKBL	Ohio: Columbus	WCAH
New Hampshire: Tilton	WBRL	South Dakota: Brookings	KGCR
New Jersey: Jersey City	WKBO	Texas: San Antonio	KGCM

Broadcasting stations, alphabetically, by call signals

Call signal	Location of station (address)	Owner of station
KGCM	San Antonio, Tex., 2412 Main Avenue	Robert B. Bridge.
KGCN	Concordia, Kans.	Alva E. Smith.
KGCR	Brookings, S. Dak., 415 Main Street	Cutler's Radio Broadcasting Service (Inc.).
KGCU	Mandan, N. Dak.	Mandan Chamber of Commerce.
KPJM	Prescott, Ariz.	Wilburn Radio Service.
KSEI	Pocatello, Idaho	KSEI Broadcasting Association.
WBRL	Tilton, N. H.	Booth Radio Laboratories.
WCAH	Columbus, Ohio, 221 West Tenth Avenue	Entrekin Electric Co.
WCAZ	Carthage, Ill.	Carthage College.
WJUG	New York, N. Y., 30 Park Place	Ida B. Ross.
WKBL	Monroe, Mich., 16 South Monroe Street	Monroeana Radio Manufacturing Co.
WKBM	Newburgh, N. Y., 369 Broadway	John W. Jones.
WKBO	Jersey City, N. J., 118 Concourse Building	Camith Corporation.
WKBP	Battle Creek, Mich.	Battle Creek Enquirer and News (A. L. Miller).
WKBQ	New York, N. Y., 1100 East One hundred and seventy-seventh Street.	Starlight Amusement Park (Inc.).
WTRC	Brooklyn, N. Y., 62 Woodbine Street	Twentieth Assembly District Regular Republican Club (Inc.).

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 Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Burgess Field, Pa. (Uniontown)[1]	WYI	1,499	O	X	U. S. Army.
Cumberland Field, Md. (Cumberland)[2]	WYL	1,499	O	X	Do.
South Pass Lightship, La.[3]	WWBK	600	O	.....	Bureau of Lighthouses.

[1] Loc. (approximately) O 79° 45' 00", N 39° 55' 00"; range, 60–200; system, U. S. Army v. t. telephone and telegraph.
[2] Loc. (approximately) O 78° 45' 00", N 39° 35' 00"; range, 60–200; system, U. S. Army v. t. telephone and telegraph.
[3] Loc. O 89° 06' 37", N 28° 58' 52"; range, 150; system, Marconi, 1,000; service, open to relaying public correspondence in emergency; hours, first 15 minutes of each hour between 8 a. m. and 9.15 p. m.

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 Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Active	NIXS	110, 115, 130..	O	X	U. S. Coast Guard.
Agassiz	NIVL	110, 115, 130..	O	X	Do.
Alert	NIVT	110, 115, 130..	O	X	Do.
Antietam	NITL	110, 115, 130..	O	X	Do.
Bonham	NIXQ	110, 115, 130..	O	X	Do.
Boutwell	NIXX	110, 115, 130..	O	X	Do.
Cahoone	NIVJ	110, 115, 130..	O	X	Do.
Cartigan	NIVK	110, 115, 130..	O	X	Do.
Crawford	NIVN	110, 115, 130..	O	X	Do.
Cuyahoga	NITM	110, 115, 130..	O	X	Do.
Diligence	NIXJ	110, 115, 130..	O	X	Do.
Dix	NIVC	110, 115, 130..	O	X	Do.
Ewing	NIXM	110, 115, 130..	O	X	Do.
Faunce	NIVV	110, 115, 130..	O	X	Do.
Frederick Lee	NIVZ	110, 115, 130..	O	X	Do.
General Greene	NIXL	110, 115, 130..	O	X	Do.
Harriet Lane	NIXR	110, 115, 130..	O	X	Do.
H. S. Taber	WYCW	600	O	X	U. S. Army.
Jackson	NIXC	110, 115, 130..	O	X	U. S. Coast Guard.
Legare	NITN	110, 115, 130..	O	X	Do.
McLane	NIVF	110, 115, 130..	O	X	Do.
Marion	NITB	110, 115, 130..	O	X	Do.
Montgomery	NITT	110, 115, 130..	O	X	Do.
Morris	NIVB	110, 115, 130..	O	X	Do.
Nemaha	NITK	110, 115, 130..	O	X	Do.
Northland	NISC	110, 115, 130..	O	X	Do.
Pulaski	NIXV	110, 115, 130..	O	X	Do.
Reliance	NIXF	110, 115, 130..	O	X	Do.
Rush	NITP	110, 115, 130..	O	X	Do.
Tiger	NIXP	110, 115, 130..	O	X	Do.
Travis	NITJ	110, 115, 130..	O	X	Do.
Vigilant	NIXK	110, 115, 130..	O	X	Do.
Winona	NIXN	110, 115, 130..	O	X	Do.
Woodbury	NIXZ	110, 115, 130..	O	X	Do.
Yeaton	NIXT	110, 115, 130..	O	X	Do.

NOTE.—All of the U. S. Coast Guard vessels mentioned above are equipped with Western Electric Co. v. t. telegraph apparatus.

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	
NISC	Northland	b	NIXC	Jackson	b
NITB	Marion	b	NIXF	Reliance	b
NITJ	Travis	b	NIXJ	Diligence	b
NITK	Nemaha	b	NIXK	Vigilant	b
NITL	Antietam	b	NIXL	General Greene	b
NITM	Cuyahoga	b	NIXM	Ewing	b
NITN	Legaro	b	NIXN	Winona	b
NITP	Rush	b	NIXP	Tiger	b
NITT	Montgomery	b	NIXQ	Bonham	b
NIVB	Morris	b	NIXR	Harriet Lane	b
NIVO	Dix	b	NIXS	Active	b
NIVF	McLane	b	NIXT	Yeaton	b
NIVJ	Caboune	b	NIXV	Pulaski	b
NIVK	Cartigan	b	NIXX	Boutwell	b
NIVL	Agassiz	b	NIXZ	Woodbury	b
NIVN	Crawford	b	WWBK	South Pass Lightship, La	c
NIVT	Alert	b	WYCW	H. S. Taber	b
NIVV	Fairfax	b	WYI	Burgess Field, Va. (Uniontown)	c
NIVZ	Frederick Lee	b	WYL	Cumberland Field, Md. (Cumberland)	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—
Cincinnati, Ohio	8YX	University of Cincinnati.
New York, N. Y. (portable)	2XAL	Associated Broadcasters (Inc.), Hotel McAlpin.
Oklahoma, Okla	5YI	David R. Wallace, 105 West Thirteenth Street.
Omaha, Nebr. (portable)	9XAB	R. J. Rockwell, 5019 Capitol Avenue.
Port Arthur, Tex	5YH	Port Arthur College.

Special land stations, grouped by districts

Call signal	District and station	Call signal	District and station
2XAL	Second district; New York, N. Y. (portable).	8YX	Eighth district: Cincinnati, Ohio.
	Fifth district:	9XAB	Ninth district: Omaha, Nebr. (portable).
5YH	Port Arthur, Tex.		
5YI	Oklahoma, Okla.		

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]

EAST HAMPTON, N. Y.—Call signal changed to WSE; range, 300; system, composite, 1,000; w. l., *600*, 630.

Strike out all particulars of he following-named stations: Kanatak, Alaska (near); Negley, Ohio; New York, N. Y. (WSE).

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]

ABSECON.—System, I. W. T. Co., 1,000; hours, N.

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

AGWIDAY.—W. l., *600*, 706, 800.

ALASKA STANDARD.—W. l., *600*, 706, 800; owner of vessel, Standard Oil Co. of California.
AMERICAN FARMER.—System, Navy-Marconi, 1000; w. l., *600*, 706, 800.
AMERICAN SHIPPER.—System, Navy-Marconi, 1000; w. l., *600*, 706, 800.
ANTINOUS.—W. l., *600*, 706, 800.
ARCADIA.—Range, 300; system, R. C. A. v. t. telegraph; w. l., *600*, 706, 750, 800, 900, 1,800, 1,900, 2,000, 2,100, 2,400.
ARCHER.—Station controlled by R. C. A. (U. S. L.).
ASHBEE.—W. l., *600*, 706, 800.
BOHEMIA.—Range, 200; system, R. C. A. v. t. telegraph; w. l., add 800; service, PG; hours, X; rates, 10 cents per word.
CALAMARES.—System, composite, 1,000; w. l., *600*, 706, 800.
CALVIN AUSTIN.—System, R. C. A. v. t. telegraph.
CAMDEN (KRC).—System, R. C. A. v. t. telegraph.
CARL D. BRADLEY.—W. l., *715*, 875.
CITY OF CLEVELAND III.—System, R. C. A., 1000 and R. C. A. v. t. telegraph; w. l., *715*, 875, 1,800.
CITY OF DETROIT III.—System, R. C. A., 1000 and R. C. A. v. t. telegraph; w. l., *715*, 875, 1800.
CITY OF ST. LOUIS.—W. l., *600*, 706, 800.
CLEMENCE C. MORSE.—Name changed to Oakman.
CLIFFWOOD.—System, Navy-W. S. A. Co., 1,000; w. l., add 800.
COCKAPONSET.—Range, 300; system, Navy-Lowenstein, 1,000; w. l., *600*, 706 800.
COELLEDA.—Station controlled by R. C. A. (U. S. L.).
COMMERCIAL TRADER.—Range, 200; system, R. C. A. v. t. telegraph; w. l., *600*, 706, 800.
CRETAN.—Station controlled by owner of vessel.
CUBA.—System, R. C. A. v. t. telegraph.
CUPRUM.—W. l., add 800.
DEER LODGE.—Station controlled by R. C. A. (U. S. L.).
DERBLAY.—Range, 200; system, Navy-Simon, 1,000; w. l., *600*, 706, 800.
DEUEL.—Owner of vessel, Grace S. S. Co.
DOLPHIN.—W. l., *600*, 706, 800.
DORCHESTER (KGBG).—Range, 300; system, R. C. A. v. t. telegraph; w. l., *600*, 706, 750, 800, 1,800, 1,900, 2,000, 2,100, 2,400.
EASTERN DAWN.—W. l., *600*, 706, 800, 1,800, 1,900, 2,000, 2,100, 2,400.
EASTERN PLANET.—System, F. T. Co. arc and Navy spark, 1,000; w. l., *600*, 706, 800, 1,800, 1,900, 2,000, 2,100, 2,400.
EDGAR F. LUCKENBACH.—System, Navy-Wireless Improvement Co., 1,000.
EDITH.—System, Navy-Simon, 1,000; w. l., *600*, 706, 800.
EL ESTERO.—W. l., *600*, 706, 800.
EL LAGO.—System, R. C. A., 1,000.
ELLENOR.—System, I. W. T. Co., 1,000.
EMIDIO.—Owner of vessel, Standard Transportation Co.
EOCENE.—Station controlled by R. C. A.
FAIRFAX.—Range, 150; system, R. C. A. v. t. telegraph; w. l., *600*, 706, 750, 800, 1,800, 1,900, 2,000, 2,100, 2,400; station controlled by R. C. A.
FALCON.—Range, 200; system, R. C. A. v. t. telegraph; w. l., *600*, 706, 750, 800, 900.
FOAM (KFSR).—Range, 200; system, I. W. T. Co., 1,000; w. l., *600*, 706, 800; station controlled by I. W. T. Co.
FREEPORT SULPHUR No. 1.—System, R. C. A. v. t. telegraph; w. l., *600*, 706, 750, 800, 900.
FREEPORT SULPHUR No. 6.—System, R. C. A. v. t. telegraph; w. l., *600*, 706, 800, 900.
GENE CRAWLEY.—System, R. C. A. v. t. telegraph; w. l., *600*, 706.
GEORGE F. RAND.—W. l., *715*, 800, 875; rates, Great Lakes service, 4 cents per word.
GEORGE H. INGALLS.—W. l., *715*, 800, 875; rates, Great Lakes service, 4 cents per word.
HATTERAS.—Station controlled by R. C. A. (U. S. L.).
HENRY P. WERNER.—W. l., *715*, 800, 875.
IDALIA.—W. l., 17, 37, 74, 127, *600*, 706, 800.
INDIANA (WFC).—Hours, N.
JEFF DAVIS.—Station controlled by I. W. T. Co. (U. S. L.).
LAFCOMO.—Station controlled by R. C. A.

LAKE ELMHURST.—Name changed to City of Albany; system, Navy-Lowenstein, 1,000.
LAKE FLATONIA.—Range, 200; system, Navy-R. C. A., 1,000; w. l., *600*, 706, 800.
LAKE GAITHER.—Range, 200; system, Navy-Simon, 1,000; w. l., *600*, *715*, 800; station controlled by I. R. T. Co.
LAKE MIRAFLORES.—Range, 200; system, Navy-Marconi, 1,000; w. l., *600*, 706, 800; station controlled by F. T. Co.
LA PLACENTIA.—System, R. C. A. v. t. telegraph; w. l., *600*, 706, 870.
LAVA.—Station controlled by R. C. A. (U. S. L.).
LEBEC.—Owner of vessel, Standard Transportation Co.
LIEBRE.—Owner of vessel, Standard Transportation Co.; station controlled by I. W. T. Co.
LURLINE.—System, R. C. A. v. t. telegraph; w. l., *600*, 706, 800, 875.
MATSONIA.—System, R. C. A. v. t. telegraph and R. C. A. spark, 1,000; w. l., *600*, 706, 800, 1,800, 2,100, 2,400.
MOHEGAN.—System, Lowenstein, 1,000; w. l., add 800.
MOJAVE.—Owner of vessel, Standard Transportation Co.
NABESNA.—W. l., add 800.
OCEANIA VANCE.—Station controlled by R. C. A.
OHIO.—Name changed to Miramichi; owner of vessel, E. W. Scripps, estate of.
OHIOAN.—W. l., add 800.
OTHO.—System, Navy-Lowenstein, 1,000.
O. T. WARING.—W. l., *600*, 706, 800, 1,800, 1,900, 2,000, 2,100, 2,400.
PACIFIC PINE.—System, Navy-Marconi, 1,000.
PARISMINA.—Range, 300; w. l., add 800.
PETREL.—System, Navy-Simon, 1,000.
PHOENIX.—Station controlled by R. C. A.
POINSETTIA.—System, composite v. t. telegraph; w. l., 37, *600*, 706; owner of vessel, Walter W. Horne.
PRESIDENT ADAMS.—W. l., *600*, 706, 800, 1,800, 1,900, 2,000, 2,100, 2,400.
PRESIDENT ARTHUR.—Station controlled by R. C. A.
QUAKER CITY.—W. l., *600*, 706, 800.
ROANOKE.—W. l., *600*, 706, 800.
SAPINERO.—W. l., add 800.
SAUGERTIES.—Station controlled by R. C. A.
SEA GULL.—Range, 150; system, Navy-K. & C., 1,000; station controlled by I. W. T. Co.
SHADOW K.—Range, 50; system, composite v. t. telephone and telegraph; w. l., 115, *600*; service, P; hours, X; owner of vessel, Peninsular Terminal Co.; station controlled by owner of vessel.
SIERRA (WHJ).—System, add F. T. Co. arc; w. l., add 800.
STANDARD SERVICE.—W. l., add 800.
SUTRANSCO.—Owner of vessel, Submarine Boat Corporation.
SWIFTWIND.—W. l., *600*, 706, 800.
SYLVAN ARROW.—System, R. C. A. v. t. telegraph; w. l., *600*, 706, 750, 800, 900.
TEJON.—Owner of vessel, Standard Transportation Co.
THE ANGELES.—System, Navy-Marconi, 1,000.
THEODORE H. WICKWIRE.—W. l., *715*, 800, 875; rates, Great Lakes service, 4 cents per word.
TOPILA.—System, Marconi, 1,000; w. l., *600*, 706, 800.
TORRES.—W. l., add 800.
UNITED STATES.—W. l., *715*, 800; service, P; station controlled by owner of vessel.
VENETIA.—W. l., *600*, 706, 800.
VIDOR.—Station controlled by R. C. A.
WATERTOWN.—System, Navy-Marconi, 1,000; w. l., *600*, 706, 800.
WEST CACTUS.—Owner of vessel, Pacific Argentine Brazil Line.
WEST CADDOA.—W. l., *600*, 706, 800.
WEST CELERON.—W. l., *600*, 706, 800.
WEST EKONK.—W. l., *600*, 706, 800.
WEST HAVEN.—Station controlled by R. C. A. (U. S. L.).
WEST IVIS.—Station controlled by I. W. T. Co. (U. S. L.)
WEST MAHOMET.—Station controlled by R. C. A.
WEST NILUS.—Station controlled by I. W. T. Co.
WEST SERENE.—W. l., *600*, 706, 800.

WILHELMINA.—System, Westinghouse v. t. telegraph and R. C. A. spark, 1,000.
YORBA LINDA.—Owner of vessel, Standard Transportation Co.
Strike out all particulars of the following-named vessels: *Charles O. Jenkins, Hermosa, Iroquois, John Ena, Lake Crescent, Laurentian.*

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

KFCS, *read* Miramichi; KOFQ, *read* City of Albany; KUGG, *read* Oakman; KZBZ-Mauban, *call should read* KZBM; WSE, *read* East Hampton, N. Y.; strike out all particulars following the call signals, KDTX, KFZM, KGC, KIRS, KVF, WBP, WCQ, WFT.

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]

KFBC (San Diego, Calif.).—Owner of station, W. K. Aabill and Union League Club of San Diego County.
KFVD (San Pedro, Calif.).—Change to Venice, Calif.; owner of station, W. J. and C. I. McWhinnie.
KFXJ (Denver, Colo.).—Change to Edgewater, Colo. (near); owner of station, R. G. Howell (Olinger Gardens).
KOIL (Council Bluffs, Iowa).—Owner of station, Mona Motor Oil Co.
KSBA (Shreveport, La.).—Owner of station, W. G. Patterson.
KZUY (Baguio, P. I.).—Strike out all particulars.
WBRC (Birmingham, Ala.).—Owner of station, Birmingham Broadcasting Corporation.
WEHS (Evanston, Ill.).—Owner of station, Oliver G. Fordham (Robert E. Hughes).
WHBJ (Fort Wayne, Ind.).—Call signal changed to WCWK; owner of station, Chester W. Keen.
WKBD (Jersey City, N. J.).—Call signal changed to WAAT.
WNAL (Omaha, Nebr.).—Owner of station, R. J. Rockwell, 5019 Capitol Avenue.
WSVS (Buffalo, N. Y.).—Owner of station, Seneca Vocational School (city of Buffalo), 666 East Delavan Avenue.

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]

LANGIN FIELD (Moundsville), W. Va.—Strike out all particulars.

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]

S. C. 154.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

WYI, read Burgess Field, Pa. (Uniontown); strike out all particulars following the call signal NOLC.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS

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

BALTIMORE, MD. (3XI).—Owner of station, George E. Sterling, 1818 Chilton Street.
EATONTOWN, N. J. (2XAU).—Strike out all particulars.
HOLLYWOOD, CALIF. (6XAL-portable).—*Read*, Los Angeles, Calif. (portable).
LOS ANGELES, CALIF. (6XBA).—Owner of station, Echophone Manufacturing Co. (K. M. Turner Radio Corporation).

MISCELLANEOUS

CHANGES IN RADIO-BEACON STATIONS

Cape Spencer Light Station, Alaska.—Characteristic changed to sound every 180 seconds; single dashes for 60 seconds; silent 120 seconds, thus:

— — — — —	Silent
60 seconds	120 seconds

Point Arguello Light Station, Calif.—This beacon will, as heretofore, sound its characteristic continuously during thick or foggy weather but will also sound in clear weather during the first 15 minutes of every odd hour from 5 p. m. to 7.15 a. m., one hundred and twentieth meridian time.

CHANGES IN FOREIGN STATIONS

Gibraltar Rock.—For the information of vessels equipped with a radiocompass it is announced that a 600-meter i. c. w. transmitter has been installed at North Front radio station, and Gibraltar Rock station's call signal (BYW) is used.

Portugal.—Lavadores station, located in latitude 41° 08′ 01″ north, longitude 8° 39′ 57″; call signal CTP now furnishes bearings to ships on request. A charge of 0.25 francs is made for each bearing. Wave length, 600 meters; range, 150 miles.

England.—On November 1 next the name of the coast station at Grimsby, call signal GKZ, will be changed to "Humber."

Ceylon.—The time signals from Colombo are now transmitted on 600 meters, i. c. w., in lieu of 600 meters, spark.

NEW LISTS OF RADIO STATIONS AVAILABLE

The list of Commercial and Government Radio Stations of the United States, edition June 30, 1926, containing a complete list of the broadcasting stations up to the date of issuance, is now available for distribution by the Superintendent of Documents, Government Printing Office, this city; price, 15 cents per copy. The Radio Service Bulletin, published monthly as a supplement to the above-named publication, may also be purchased from the Government Printing Office; price, 5 cents per copy; subscription price, 25 cents per year.

The list of Amateur Radio Stations of the United States, edition June 30, 1926, will probably be ready for distribution about November 1 next. This publication can also be obtained from the above-named office; price, 25 cents per copy.

VESSELS EQUIPPED WITH A RADIOCOMPASS

The following-named vessels were recently equipped with a radiocompass: *Joseph H. Frantz*, *Rayo*, and *Santa Luisa*.

FREE MEDICAL RADIO SERVICE RENDERED BY THE TROPICAL RADIO TELEGRAPH CO. AND THE UNITED FRUIT CO.

The United Fruit Co. announces that the free medical radio service, which it inaugurated on August 1, 1922, from its hospitals in the various countries of Central America and from the passenger ships in its service, is now available for ships at sea through an additional number of stations. The following is a list of radio stations of the Tropical Radio Telegraph Co. and of the United Fruit Co. through which this service may hereafter be obtained without charge, so far as these companies are concerned, by ships of all nationalities:

Radio station	Call letters	Radio station	Call letters
Boston, Mass.	WBF	Puerto Barrios, Guatemala	UF
Miami, Fla.	WAX	Managua, Nicaragua	UL
New Orleans, La.	WNU	Bluefields, Nicaragua	UQ
Burrwood, La.	WBW	Cape Gracias, Nicaragua	UW
Fort Morgan, Ala.	WIO	Puerto Limon, Costa Rica	UX
Mobile, Ala.	WNN	Almirante, Panama	UB
Swan Island, Caribbean Sea	US	Santa Marta, Colombia	UJ
Tegucigalpa, Honduras	UO		

Free medical radio service is also available through the Tela Railroad Co.'s radio station, call letters UC, Tela, Honduras, and through the Truxillo Railroad Co.'s radio station, call letters UA, Puerto Castilla, Honduras. Both of these stations may be reached through any station of the United Fruit Co. or of the Tropical Radio Telegraph Co. listed above.

All passenger ships in the United Fruit Co. service carry doctors, and free medical service may also be secured by radio from any of them by addressing a radiogram to "Ship's doctor" followed by the name of the steamship. The radio call letters of the steamships in the company's service can be obtained from either the list of Commercial and Government Radio Stations of the United States, or from the International List of Radio Telegraph Stations (Berne).

This free medical service is maintained primarily for the benefit of ships at sea which do not carry doctors. Should occasion require, however, the doctors of other ships may hold consultation by radio with the United Fruit Co.'s hospital staffs or with doctors on steamships in its service.

Radiograms requesting medical advice should be signed by the captain of the ship and should state briefly but clearly the symptoms of the person afflicted. Such radiograms, if intended for a United Fruit Co. hospital, should be addressed "Unifruiteo," followed by the name of the place where the hospital is located. United Fruit Co. hospitals giving this service are located at the following places, and also may be reached through any of the above-mentioned radio stations: Santa Marta, Colombia; Puerto Limon, Costa Rica; Almirante, Panama; Puerto Barrios, Guatemala.

This service may also be obtained at the hospital of the Tela Railroad Co., Tela, Honduras, and at the hospital of the Truxillo Railroad Co., Puerto Castilla, Honduras. Radiograms for these hospitals should be addressed "Telaraileo" and "Truraileo," respectively.

Medical advice radiograms must be checked and send "DH Medico." Such radiograms will be given preference over all other radiograms, except SOS calls, throughout the radio service of the Tropical Radio Telegraph Co. and the United Fruit Co.

Physicians and surgeons comprising the medical staff of the above-mentioned hospitals are all duly qualified. In view of the fact, however, that this radio medical service to ships at sea is free and is given without opportunity for a personal examination of the patients, no responsibility whatsoever will be assumed by the United Fruit Co. or its associated companies or by the physi-

clans and surgeons giving the advice, nor shall any responsibility attach for errors or delays in the receipt of transmission of any radiogram sent or received in connection with this service.

LOST COMMERCIAL RADIO OPERATORS' LICENSES

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

Name	Class	No.	Date issued	Port issued
Alexonis, Anthony J.	Second	4217	Apr. 3, 1925	Chicago.
Bauer, Carl A.	First	147	Dec. 7, 1925	Washington.
Burt, Frank C.	do	14347	Oct. 23, 1925	New Orleans.
Callaway, James C.	do	12310	Dec. 18, 1924	New York.
Collins, William D.	do	10007	June 26, 1924	Do.
Cornelius, Yewell M.	do	11118	Sept. 17, 1924	New Orleans.
Escher, Mason R.	do	10234	July 23, 1926	New York.
Goodbee, Gordan W.	Second	2077	Jan. 19, 1924	New Orleans.
Guerin, Byram C., jr.	First	18152	Aug. 3, 1925	New York.
Gussman, Allen P.	do	4260	Mar. 15, 1923	Seattle.
Hickmott, William H.	do	6007	May 14, 1925	Detroit.
Holland, Maurice	do	13128	July 22, 1925	New York.
Hollister, Kenneth G.	do	10691	Aug. 21, 1924	Seattle.
Jarrette, Vernon	Second	3903	Aug. 23, 1924	Baltimore.
Love, Harry B.	First	14619	Sept. 10, 1925	New York.
Middleton, Charles	Second	4268	July 10, 1925	Chicago.
Moore, Paul J.	First	11168	Nov. 19, 1924	New Orleans.
Nembach, M. A.	do	14677	Oct. 6, 1925	New York.
O'Rourke, Philip A.	do	10977	July 28, 1924	Do.
Perez, Charles	do	12163	Sept. 11, 1924	Do.
Persell, Ralph M.	do	15956	Apr. 16, 1926	Do.
Sibens, Harold	Second	4038	Mar. 19, 1924	Chicago.
Styer, Chester L.	First	14049	Sept. 22, 1925	New York.
Testa, Luke J.	do	12227	Dec. 24, 1924	Do.
Tierney, Paul V.	Second	4348	Feb. 12, 1926	Chicago.
Vuoteni, William J.	First	12295	Dec. 12, 1924	New York.
Wallis, Arthur P.	Extra	64	Apr. 21, 1924	Do.
Wolfe, Irwin R.	First	12427	Feb. 24, 1925	Do.
Young, Karl M.	do	6758	Nov. 21, 1924	Chicago.

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 frequency standards.

As shown by the list of "constant frequency stations," there may be many stations not measured in the bureau's laboratory which maintain their frequencies just as constant as these. There is, of course, no actual guaranty that the stations named below will maintain the constancy shown, but the data indicate the high degree of confidence that can be placed in them. The transmitted frequencies from these stations can be utilized for standardizing 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.

Station	Owner	Location	Frequency (kilocycles)	Period covered by measurements (months)	Number of times measured	Deviations from assigned frequencies noted in measurements	
						Average	Greatest since Aug. 25, 1926
						Per ct.	Per ct.
NSS	U. S. Navy	Annapolis, Md	17.50	4	20	0.2	0.3
WCI	Radio Corporation of America.	Barnegat, N. J	17.95	19	90	.1	.1
WGG	Do	Tuckerton, No. 1, N. J.	18.80	37	265	.1	.2
WII	Do	New Brunswick, N. J.	21.80	17	125	.1	.0
WRT	Do	....do	22.60	16	40	.1	(1)
WVA	U. S. Army	Annapolis, Md	100	18	157	.2	.2
NAA	U. S. Navy	Arlington, Va	112	11	62	.2	.2
WEAF	American Telephone & Telegraph Co.	New York, N. Y	610	21	136	.0	.0
WRC	Radio Corporation of America.	Washington, D. C	640	33	149	.1	.2
WIZ	Do	Bound Brook, N. J	660	4	14	.1	.1
NAA	U. S. Navy	Arlington, Va	690	4	26	.0	.0
WGY	General Electric Co	Schenectady, N. Y	793	39	179	.1	.0
WBZ	Westinghouse Electric & Manufacturing Co.	Springfield, Mass	900	27	81	.1	.1
KDKA	Do	East Pittsburgh, Pa	970	4	24	.1	.2
KDKA[2]	Do	....do	4,711	4	15	.1	.1

[1] Not measured since Aug. 25.

[2] High-frequency telephone transmitting set.

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 assigned 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.

Stations included in the following list employ a special device for controlling or checking their frequencies and fulfill two additional conditions: (1) The frequency calibration of the device is in agreement with the frequency standards of the Bureau of Standards; (2) the station has given evidence of following carefully a special procedure in the use of the device. The special devices for frequency regulation include automatic piezo control, piezooscillators, piezoresonators, and frequency indicators. A frequency indicator is a special type of frequency meter (wave meter) so constructed as to give readings at only a single point or over a very narrow range of frequencies (not over 10 per cent). The usual frequency meter designed for measurements of frequencies over a wide range is not suitable for this purpose.

Stations not included in the list which use one of the special devices for frequency regulation are invited to communicate with the Bureau of Standards, giving details of the method of checking the frequency and information concerning the transmitting equipment which would have a bearing on the constancy of the radiated frequency.

The use of the piezooscillator for checking a station's frequency and the use of a frequency indicator are described, respectively, in Bureau of Standards Letter Circulars 186 and 180, which publications give, in addition, specifications for the construction of these devices. They are entitled, respectively, "Specifications for portable piezooscillator, Bureau of Standards Type N," and "Specifications for frequency indicator, Bureau of Standards Type B, for use in radio-

transmitting stations." Either letter circular may be obtained by a person having actual use for it upon application to the Bureau of Standards.

Station	Owner	Location	Frequency (kilocycles)	Wave length (meters)	Apparatus for frequency regulation
KFRU	Stephens College	Columbia, Mo	600	499.7	Frequency indicator.
WOC	Palmer School of Chiropractic.	Davenport, Iowa	620	483.6	Piezooscillator.
WTIC	Travelers' Insurance Co.	Hartford, Conn	630	475.9	Do.
WMAQ	Chicago Daily News	Chicago, Ill	670	447.5	Frequency indicator, type B.
KLDS	Reorganized Church of Jesus Christ of Latter-Day Saints.	Independence, Mo	680	440.9	Frequency indicator.
WLW	Crosley Radio Corporation.	Harrison, Ohio	710	422.3	Frequency indicator and piezooscillator.
WCCO	Washburn-Crosby Co.	Minneapolis-St. Paul, Minn.	720	416.4	Piezooscillator.
WTAM WEAR	Willard Storage Battery Co.	Cleveland, Ohio	770	389.4	Do.
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	Piezooscillator.
KGO	General Electric Co.	Oakland, Calif	830	361.2	Do.
WJAD	Frank P. Jackson	Waco, Tex	850	352.7	Frequency indicator, type B.
WWJ	Detroit News	Detroit, Mich	850	352.7	Do.
WLS	Sears, Roebuck & Co.	Crete, Ill	870	344.6	Piezooscillator.
KFAB	Nebraska Buick Auto Co.	Lincoln, Nebr	880	340.7	Do.
WKAQ	Radio Corporation of Porto Rico.	San Juan, P. R	880	340.7	Frequency indicator, type B.
KOA	General Electric Co.	Denver, Colo	900	332.4	Piezooscillator.
WEAO	Ohio State University	Columbus, Ohio	1,020	293.9	Frequency indicator, type B.
KWCR	Harry F. Parr	Cedar Rapids, Iowa	1,080	277.5	Piezooscillator.
WYBQ	Wm. F. Gable Co.	Altoona, Pa	1,080	277.6	Frequency indicator.
KFKA	Colorado State Teachers' College.	Greeley, Colo	1,100	272.6	Piezooscillator.
WBAA	Purdue University	Lafayette, Ind	1,100	272.6	Do.
WOI	Iowa State College	Ames, Iowa	1,110	270.1	Automatic piezocontrol (checked with type B frequency indicator).
KFH	Hotel Lassen (Rigby-Gray Hotel Co.).	Wichita, Kans	1,120	267.7	Frequency indicator, type B.
WENR	All American Radio Corporation.	Chicago, Ill	1,130	265.3	Piezooscillator.
WCAD	St. Lawrence University	Canton, N. Y	1,140	263	Frequency indicator, type B.
WAAM	I. R. Nelson	Newark, N. J	1,140	263	Piezooscillator.
WSKC	World's Star Knitting Co.	Bay City, Mich	1,150	260.7	Frequency indicator.
WOWO	Main Auto Supply Co.	Fort Wayne, Ind	1,320	227.1	Piezooscillator.
WBBM	Atlas Investment Co.	Chicago, Ill	1,330	226.4	Do.
WEBQ	Tate Radio Co.	Harrisburg, Ill	1,330	225.4	Do.
KFVS	Hirsch Battery & Radio Co.	Cape Girardeau, Mo	1,340	223.7	Frequency indicator type B.
WOK	Nouirowound Radio Manufacturing Co.	Homewood, Ill	1,380	217.3	Piezooscillator.
WPDQ	Hiram L. Turner	Buffalo, N. Y	1,460	205.4	Frequency indicator, type B.

BIBLIOGRAPHY ON RADIO WAVE PHENOMENA AND MEASUREMENT OF RADIO FIELD INTENSITIES

The Bureau of Standards has just issued Letter Circular No. 207, Bibliography on Radio Wave Phenomena and Measurement of Radio Field Intensities. The references in this list include the important papers on these subjects from early years to the present. It is expected that persons using this bibliography will notify the bureau of any corrections or desirable additions, so that a revised edition may be issued. Copies may be obtained by persons having actual use for them upon application to the Bureau of Standards, Washington, D. C.

ESTABLISHMENT OF RADIO STANDARDS OF FREQUENCY BY THE USE OF A HARMONIC AMPLIFIER

A scientific paper just issued by the Bureau of Standards, entitled "Establishment of Radio Standards of Frequency by the Use of a Harmonic Amplifier," describes a method used by the Bureau of Standards in establishing radio standards of frequency. It consists in the "stepping up" from a known low frequency to a radio frequency by the use of harmonics. The known low frequency used as a fundamental is a 1,025-cycle tuning fork driven by an electron tube. The low-frequency output from the tuning fork is carried through an amplifier, which distorts it and produce harmonics. Any desired harmonic may be selected by tuning the amplifier to its frequency. This harmonic is then amplified to sufficient power to operate the frequency meter (wave meter) under standardization. By selecting different harmonics of the tuning fork the entire range of a frequency meter from about 10 to 4,000 kilo cycles (30,000 to 75 meters) may be obtained from one tuning fork of known frequency. Any fixed frequency generator such as a piezooscillator may be standardized by the use of the harmonic amplifier with an auxiliary device for determining the frequency of the audible beat note between a harmonic from the known tuning-fork frequency and the unknown piezooscillator frequency.

The auxiliary device used in determining the beat-note frequency between a harmonic of the amplifier and unknown source is a sonometer. It consists of steel piano wire mounted across two movable knife-edges with a known tension applied. The frequency at which the wire will vibrate may by computed from its mass, tension, and length. The beat-note frequency is applied to the wire through a telephone receiver. The wire vibrates when its frequency is equal to the frequency of the applied beat-note frequency, due to the attraction of the wire by the telephone magnet. Thus the frequency of the beat note may be obtained by computing the vibration frequency of the wire. Two audio frequencies may be compared very accurately by the use of the harmonic amplifier and sonometer.

This publication is Scientific Paper No. 530, Establishment of Radio Standards of Frequency by the Use of a Harmonic Amplifier, by C. B. Jolliffe and Miss Grace Hazen. It may be obtained for 10 cents a copy from the Superintendent of Documents, Government Printing Office, Washington, D. C.

REFERENCES TO CURRENT RADIO LITERATURE

This is a monthly list of references prepared by the radio laboratory of the Bureau of Standards and is intended to cover the more important papers of interest to professional radio engineers which have recently appeared in periodicals, books, etc. The number at the left of each reference classifies the reference by subject, in accordance with the scheme, presented in A Decimal Classification of Radio Subjects—An Extension of the Dewey System, Bureau of Standards Circular No. 138, a copy of which may be obtained for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. The various articles listed below are not obtainable from the Bureau of Standards. The various periodicals can be consulted at large public libraries.

R100.—*Radio principles*

R113 Bäumler, M. Die Ausbreitung der elektromagnetischen Wellen längs der Erdoberfläche. Elektrotechnische Zeitschrift, 47, pp. 965–969, Aug. 19, 1926.

R113 Cartier, Gén. La Radiophonie et les phénomènes de propagation (suite). QST Francais et Radioélectricité, 7, pp. 15–20; September, 1926.

R113.1 Bidwell, C. C. Why signals fade. Popular Radio, 10, pp. 531–533; October, 1926.

R113.2 Rukop, H. Neuere Ergebnisse in der drahtlosen Telegraphie mit kurzen Wellen. Jahrb. d. Drahtlosen Telegraphie, 28, pp. 41–50; 1926.

R113.3 Smith-Rose, R. L., and Barfield, R. H. The cause and elimination of night errors in radio direction finding. Jour. Inst. Elec. Engrs. (London), 64, pp. 831–843; August, 1925.

R113.4 Breit, G., and Tuve, M. A. A test of the existence of the conducting layer. Physical Review, 28, pp. 554–575; September, 1926.

R113.9 Esau, A. Über das Verhalten von Empfängern bei Polarisations-änderungen der Elektrischen Wellen (Fadingerscheinungen). Jahrb. d. Drahtl. Teleg., 28, pp. 50–53; 1926.

R115 Esau, A. Richtcharakteristiken von Antennenkombinationen (Fortsetzung). Jahrb. d. Drahtl. Teleg., 28, p. 1; 1926.

R130 Granikowski, J. Étude des gaz occlus dans les triodes. L'Onde Électrique, 5, pp. 404–412; August, 1926.

R131 Henney, K. How to measure your own tubes. Radio Broadcast, 9, pp. 499–503; October 1926.

R132 Pearson, S. O. Wireless circuits in theory and practice. (Valve amplifiers.) Wireless World and Radio Review, 19, pp. 313–14; September 1, 1926.

R132.3 Hiecke, Dr. R. Die Widerstandsverstärkung. Elektrotechnik u. Maschinenbau, 44, pp. 89–92; September 5, 1926.

R132.3 Mercier, M. Recherches sur les meilleures conditions de fonctionnement d'un amplificateur a résistances. L'Onde Électrique, 5, pp. 413-424; August, 1926.
R134.45 Sacazes, J. M. La super-réaction par lampe bigrille. QST Francais et Radioélectricité, 7, pp. 51-55; September, 1926.
R139 Chauvierre, M. La lampe à deux grilles QST Francais et Radioélectricité, 7, pp. 32-41; September, 1926.
R139 Rowe, G. C. B. Lampe de réception a éléments multiples. QST Francais et Radioélectricité, 7, pp. 28-31; September, 1926.
R142 Van der Pol, B. Der Einfluss der Dämpfungen auf die Frequenzen zweier gekoppelten Kreise. Jahrb. d. Drahtl. Teleg., 28, pp. 12-15; 1926.
R145.5 Banner, E. H. W. Common errors in condenser calculation. Experimental Wireless, 3, pp. 556-58; September, 1926.
R153 Fromy, E. Les relais a arc. L'Onde Électrique, 5, pp. 379-403; August, 1926.

R200.—*Radio measurements and standardization*

R214 Dawson, L. H. Examining quartz for oscillator use. QST, 10, pp. 23-25; September, 1926.
R214 Scheibe, A. Piezoelektrische Resonanzerscheinungen. Jahrb. Drahtl. Teleg., 28, pp. 15-26; 1926.
R214 Winters, S. R. See and hear wave length with crystal tube. Radio Age, 5, p. 8; October, 1926.
R214 Luminous frequency standards. QST, 10, pp. 17-19; September, 1926.
R220 Tagger, J. Ein neuer Apparat zur Messung kleiner und kleinster Kapazitäten. Physikalische Zeitschrift, 27, pp. 569-74; September 1, 1926.

R300.—*Radio apparatus and equipment*

R325.1 Stirling, W. H. An accurate direction finder. Radio (San Francisco), 8, pp. 19-20; September, 1926.
R330 Radiotron Model UX-210. QST, 10, pp. 33-36; September, 1926.
R342 Harris, S. Types of audio-amplifiers. Radio News, 8, p. 364; October, 1926.
R342.2 Anderson, J. E. Distortion in resistance coupled amplifiers. Radio (San Francisco), 8, pp. 25-26; September, 1926.
R342.6 Adelman, L. L. Methods of oscillation control in stabilized receivers. Radio News, 8, p. 367; October, 1926.
R342.6 Hatry, L. W. Tuned radio-frequency. Radio (San Francisco), 8, p. 31; September, 1926.
R342.6 McLachlan, N. W. The amplification and selectivity of a neutralized tuned anode circuit. Experimental Wireless, 3, pp. 545-52; September, 1926.
R343 Cazes, A. Présentation d'un appareil "bireflexe." L'Onde Électrique, 5, pp. 425-28; August, 1926.
R343.7 Roland, B. F. An A, B, C line supply device. Radio Broadcast, 9, pp. 485-89; October, 1926.
R344.3 Clayton, J. M. Break-in and remote control. QST, 10, pp. 9-13; September, 1926.
R376.3 Farrand, C. L. Cone loud-speakers. Radio Broadcast, 9, pp. 514-16; October, 1926.
R383.1 Morgan, J. Metallized high resistance units. QST, 10, pp. 37-39; September, 1926.
R385.5 Green, G. On the condenser-telephone. Philosophical Magazine, 2, pp. 497-508; September, 1926.

R400.—*Radio communication systems*

R401 Dunlap, O. E., jr. Acres of radio. Scientific American, pp. 178-9; September, 1926.
R401 Howe, Prof. G. W. O. Radio-Wien. Experimental Wireless, 3, pp. 533-43; September, 1926.
R420 Ditcham, W. T. The keying of valve transmitters. Experimental Wireless, 3, pp. 526-31; September, 1926.
R420 Haynes, F. H. Low-power transmitter receiver for two-way working. Wireless World and Radio Review, 19, pp. 247-52; August 25, 1926.
R435 Cartier, Gén. Télégraphie et Radiotélégraphie. Radio-électricité, 7, pp. 297-301; August 10, 1926.
R435 Jammet, J. Système de communications électriques secrètes. L'Onde Électrique, 5, pp. 365-78; August, 1926.

R500.—*Applications of radio*

R505 Tawresey, Lieut. Commander A. P. H. Broadcasting and the United States Navy. Radio Age, 5, p. 11; October, 1926.
R582 Freund, B. Drahtlose Weitübertragung von getönten Bildern. Elektrotechnik u. Maschinenbau, 44, pp. 81-84; August 22, 1926.

R600.—*Radio stations: Equipment, operation, and management*

R620.8 Peck, A. P. The radio beginner—assuring safety in radio installation. Radio News, 8, pp. 328-9; October, 1926.

R800.—*Nonradio subjects*

534 Trendelenburg, F. Methoden und Ergebnisse der Klangforschung. Jahrb. d. Drahtl. Teleg., 28, pp. 54-64; 1926.

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
5 CENTS PER COPY
SUBSCRIPTION PRICE, 25 CENTS PER YEAR
△