

DEPARTMENT OF COMMERCE

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION

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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 = Radio compass 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. Co.	= Independent Wireless Telegraph Co.
K. & C.	= Kilbourne & Clark Manufacturing Co.
R. C. A.	= Radio Corporation of America.
U. R. Corp.	= Universal Radio Corporation.
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.
U. S. L.	= After operating company denotes that the change applies only to the List of Radio Stations of the United States

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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, 1925, and to the International List of Radiotelegraph Stations published by the Bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by--
Detroit, Mich. ¹	WDI	715, 875	PG		Intercity Radio Telegraph Co.
Lawton, Okla. ²	KPP	140	FX	X	Southwestern Light & Power Co.
Los Angeles, Calif. ³	KZA	44	FX	X	Jay Peters.
Los Angeles, Calif. (portable) ⁴	KZB	44	FX	X	Do.
Oklahoma, Okla. (portable) ⁵	KPK	140	FX	X	Southwestern Light & Power Co.
Oklahoma, Okla. ⁶	KPR	140	FX	X	Do.
Quannah, Tex. ⁷	KPG	140	FX	X	Quannah Light & Ice Co.
Springdale, Pa. ⁷	WOY	137	YX	X	West Penn Power Co.

¹ Range, 150; system, Simon v. t. telegraph; hours, 8 a. m. to 5 p. m.; rates, ship service, 10¢ per word.
² Loc. (approximately) 0.98° 30' 00", N. 24° 30' 00"; range, 100; system, composite v. t. telephone and telegraph.
³ Range, 50; system, composite v. t. telegraph.
⁴ Range, 50; system, composite v. t. telephone and telegraph.
⁵ Loc. (approximately) 0.97° 30' 00", N. 85° 30' 00"; range, 100; system, composite v. t. telephone and telegraph.
⁶ Loc. (approximately) 0.99° 30' 30", N. 34° 15' 00"; range, 100; system, composite v. t. telephone and telegraph.
⁷ Loc. (approximately) 0.79° 40' 00", N. 40° 33' 00"; range, 50; system, composite v. t. telephone and telegraph.

Commercial ship stations, alphabetically by names of vessels

[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 Bureau]

Name of vessel	Call signal	Rates	Service	Hours	Owner of vessel	Station controlled by--
Billow	KFXU	8	PG	X	Bay State Fishing Co.	R. C. A.
Breaker	KFXZ	8	PG	X	do.	Do.
City of Dallas	KOPV	8	PG	X	Southern Steamship Co.	
Oceanus	WTA	8	PG	N	Coamo Steamship Corporation	
Columbia	KFYH				Charles Perez	L. W. T. Co.
Justin	KFYM	8	PG	X	Lawrence Steamship Co.	R. C. A.
Kameest	KEDG	8	PG	X	United States Shipping Board	L. W. T. Co.
Michabo	KFYG	8	PG	X	Floyd L. Carlisle	Do.
Noeco	KFYB	8	PG	X	Northland Transportation Co.	Do.
Oceanus ¹	KFYC	8	PG	X	John W. Kiser	Do.
Peerless	KFYI	8	PG	X	Wood Towing Corporation	R. C. A.
Phoenix	WJEO	8	PG	X	American Tankers Corporation	L. W. T. Co.
Santurco	KRMV	8	PG	X	Lawrence Steamship Co.	Do.
Sultana	KFXW				Fred B. Dunn	R. C. A.
Thomas Tracy	KFYE	8	PG	X	M. & J. Tracy (Inc.)	
Wave	KFYA	8	PG	X	Bay State Fishing Co.	Do.

¹ Range, 150; system, Telefunken, 1000; w. l., 600, 706, 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		
KEDG	Kameest	b	KFYM	Justin	b
KEMV	Santurco	b	KOPV	City of Dallas	b
KFXU	Billow	b	KPG	Quannah, Tex.	c
KFXW	Sultana	b	KPK	Oklahoma, Okla. (portable)	c
KFXZ	Breaker	b	KPP	Lawton, Okla.	c
KFYA	Wave	b	KPR	Oklahoma, Okla.	c
KFYB	Noeco	b	KZA	Los Angeles, Calif.	c
KFYC	Oceanus	b	KZB	Los Angeles, Calif. (portable)	c
KFYE	Thomas Tracy	b	WDI	Detroit, Mich.	c
KFYG	Michabo	b	WJEO	Phoenix	b
KFYH	Columbia	b	WOY	Springdale, Pa.	c

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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
Arizona: Flagstaff.....	KFXV	Michigan—Continued	
California:		Royal Oak.....	WAGM
Oxnard.....	KFYF	Ypsilanti.....	WJBE
San Jose.....	KFAF	Missouri:	
District of Columbia: Washington.....	WMAL	Columbia.....	KFRU
Florida: Clearwater.....	WGHB	Moberly.....	KFOJ
Illinois: Sycamore.....	WJBN	New York: Buffalo.....	WPDQ
Iowa:		Ohio: Columbus.....	WAIU
Clarinda.....	KSO	Oklahoma: Bristow.....	KVOO
Muscatine.....	KTNT	Oregon: Portland.....	KQP
Massachusetts:		Tennessee: Nashville.....	WSM
New Bedford.....	WNBH	Texas:	
Worcester.....	WTAG	Austin.....	KUT
Maine: Bangor.....	WABI	Houston (portable).....	KFYJ
Michigan:		United States: Portable station.....	WCWS
Detroit.....	WMBC	Virginia: Richmond.....	WRVA

Stations broadcasting market or weather reports, music, concerts, lectures, etc. alphabetically by call signals

Call signal	Location of station (address)	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
KFAF	San Jose, Calif., Montgomery Hotel.	Alfred E. Fowler.....	50	217.3	1,380
KFOJ	Moberly, Mo.....	Moberly High School.....	10	242.0	1,240
KFRU	Columbia, Mo.....	Stephens College.....	500	499.7	600
KFXV	Flagstaff, Ariz. (Orpheum Theater).	Mary M. Costigan.....	50	205.4	1,460
KFYF	Oxnard, Calif.....	Carl's Radio Den (Newcomb Radio Co.).....	10	235.4	1,460
KFYJ	Houston, Tex. (portable).....	Houston Chronicle Publishing Co.....	10	238.0	1,280
KQP	Portland, Oreg., 441 Sixth Street.	H. B. Reed.....	500	212.6	1,410
KSO	Clarinda, Iowa.....	A. A. Berry Seed Co.....	500	242.0	1,240
KTNT	Muscatine, Iowa.....	Norman Baker.....	500	256.0	1,170
KUT	Austin, Tex.....	University of Texas.....	500	231.0	1,300
KVOO	Bristow, Okla.....	Voice of Oklahoma.....	500	374.8	800
WABI	Bangor, Me.....	First Universalist Church.....	100	240.0	1,250
WAGM	Royal Oak, Mich.....	Robert L. Miller.....	50	258.6	1,160
WAIU	Columbus, Ohio.....	American Insurance Union.....	500	243.9	1,020
WCWS	United States (portable), 69 Exchange Street, Providence, R. I.	Charles W. Seien.....	100	269.7	1,420
WGHB	Clearwater, Fla.....	The George H. Bowles Developments.....	500	266.0	1,120
WJBE	Ypsilanti, Mich., 803 Congress Street.	Ernest F. Goodwin.....	10	232.0	1,290
WJBN	Sycamore, Ill.....	St. John's Evangelical Lutheran Church.....	10	264.0	1,170
WMAL	Washington, D. C., 712 Eleventh Street.	M. A. Leese Optical Co.....	15	212.6	1,410
WMBC	Detroit, Mich., Hotel Addison..	Michigan Broadcasting Co. (F. G. Siegel).....	100	236.4	1,170
WNBH	New Bedford, Mass., New Bedford Hotel.	Irving J. Vermilya and A. J. Lopez.....	250	248.0	1,210
WPDQ	Buffalo, N. Y., 121 Norwood Avenue.	Hiram L. Turner.....	50	205.4	1,460
WRAV	Richmond, Va.....	Larus & Brother Co.....	1,000	256.0	1,170
WSM	Nashville, Tenn.....	National Life & Accident Insurance Co.....	1,000	282.8	1,000
WTAG	Worcester, Mass.....	Worcester Telegram Publishing Co.....	500	238.0	1,220

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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, 1925, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
New Shoreham Station, ¹ Block Island, R. I.	NGB	120, 143	O	X	U. S. Coast Guard.

¹ Range, 50; system, Western Electric v. t. telephone and 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
NGB	New Shoreham Station, Block Island, R. I. ^c		

Special land stations, alphabetically by names of stations

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

Station	Call signal	Station controlled by—
Bound Brook, N. J.	2XAR	Westinghouse Electric & Manufacturing Co.
Hialeah, Fla.	4XG	Tropical Radio Telegraph Co.
Gibson, Ind.	9XS	New York Central R. R. Co.
Gloicester, Mass.	1XI	John Hays Hammond, Jr.
Los Angeles, Calif. (portable).	6XAB	Radiore Co., 839 Citizens National Bank Building.
Maywood, Ill.	9XR	Post Office Department.
New York, N. Y.	2XAJ	William H. Taylor Finance Corporation, 17 Battery Place.
Richmond, Va.	3XE	Larus & Brother Co.

Special land stations grouped by districts

Call signal	District and station	Call signal	District and station
1XI	First district: Gloucester, Mass.	6XAB	Sixth district: Los Angeles, Calif. (portable).
2XAJ	Second district: New York, N. Y.	9XR	Ninth district: Maywood, Ill.
2XAR	Bound Brook, N. J.	9XS	Gibson, Ind.
3XE	Third district: Richmond, Va.		
4XG	Fourth district: Hialeah, Fla.		

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, 1925, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

BELFAST, ME. (WGU).—W. l., 1,603.

CLEVELAND, OHIO (WMI).—Loc. 0.81° 42' 10", N. 41° 25' 05"; range, 400; system, composite v. t. telegraph; w. l., add 1,733.

DULUTH, MINN.—W. l., strike out 1,800.

CASPER, WYO.—W. l., 59.

HIDDEN INLET, ALASKA.—W. l., 600, 725; service, P.

HILLSBORO, OREG. (KEK).—W. l., 600, 706.

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NEW ORLEANS, LA.—W. l., add 1,713, strike out 2,850.

PIRATE COVE, ALASKA.—Service, FX.

Strike out all particulars of the following-named stations: Austin, Tex.; Baltimore, Md. (WLL); Glasgow, Mont.; Johnswood, Mich.; Kukak Bay, Alaska; Shock, Ky.

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, 1925, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

ADAM E. CORNELIUS.—W. l., 715, 800, 875; rates, Great Lakes' service, 4 cents per word.

ADMIRAL DEWEY.—Controlled by F. T. Co.

ADMIRAL EVANS.—Range, 150-300; system, F. T. Co. arc and F. T. Co., 1,000; w. l., 600, 706, 800, 1,800, 2,100, 2,400; controlled by F. T. Co.

ADMIRAL FARRAGUT.—Controlled by F. T. Co.

ADMIRAL FISKE.—Controlled by F. T. Co.

ADMIRAL PEARY.—Controlled by F. T. Co.

ADMIRAL RODMAN.—System, F. T. Co., 1,000; w. l., add 800; controlled by F. T. Co.

ADMIRAL ROGERS.—System, F. T. Co., 1,000; w. l., add 800; controlled by F. T. Co.

ADMIRAL SCHLEY.—Range, 150-300; system, F. T. Co. arc and F. T. Co., 1,000; w. l., 600, 706, 800, 1,800, 2,100, 2,400; controlled by F. T. Co.

ADMIRAL SEBREE.—System, F. T. Co., 1,000; w. l., 600, 706, 800; controlled by F. T. Co.

ADMIRAL WATSON.—Controlled by F. T. Co.

AGWISUN.—W. l., 600, 706.

AMERICAN.—Range, 150; system, Telefunken, 1,000; w. l., 600, 706, 800.

ARIZONA.—W. l., 715.

ASTORIA.—W. l., 600, 706, 800; controlled by R. C. A. (U. S. L.).

BALLCAMP.—Controlled by R. C. A. (U. S. L.).

BARACOA.—W. l., add 800.

BARLOW.—Controlled by R. C. A.

BENJAMIN BREWSTER.—System, R. C. A. v. t. telegraph; w. l., 600, 706, 750, 800, 900.

BLAIR.—Export S. S. Corporation, owner of vessel.

BEACONLIGHT.—W. l., 600, 706, 800.

CAPE ANN.—W. l., 600, 706, 800.

CAPE MAY.—W. l., add 800.

CARENCO.—W. l., 600, 706, 800; Export S. S. Corporation owner of vessel; controlled by I. W. T. Co.

CASPER.—W. l., strike out 450.

CATHERINE G. SUDDEN.—W. l., 600, 706, 800.

CHALLAMBA.—System, F. T. Co., 1,000; w. l., add 800; controlled by F. T. Co.

CHARLES C. WEST.—Range, 200; system, Navy-Simon, 1,000; w. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word; controlled by owner of vessel.

CITY OF ST. JOSEPH (KOSM).—W. l., add 800; Export S. S. Co. owner of vessel.

CITY OF WEATHERFORD.—Controlled by R. C. A.

CLIFFORD F. MOLL.—W. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.

COELLEDA.—Controlled by R. C. A. (U. S. L.).

COLD HARBOR.—W. l., 600, 706, 800; Consolidated Navigation Co. owner of vessel.

COLDWATER.—W. l., add 450.

COLLINGSWORTH.—Controlled by R. C. A. (U. S. L.).

COMAL.—System, Marconi, 1,000; w. l., 600, 706, 800.

COPPENAM.—Range, 200; w. l., 600, 706.

CORNELIA.—System, Navy-Marconi, 1,000; w. l., 600, 706, 800.

CORSON.—Export S. S. Co. owner of vessel; controlled by I. W. T. Co.

CRANFORD.—Controlled by R. C. A. (U. S. L.).

CULBURRA.—W. l., 600, 706, 800; controlled by F. T. Co.

CUPRUM.—Controlled by I. W. T. Co.

CURACAO.—System, F. T. Co., 1,000; w. l., 600, 706, 800; controlled by F. T. Co.

CYTHERIA.—Correct orthography, Cytheria.

DOROTHY ALEXANDER.—Range, 150-300; system, F. T. Co. arc and F. T. Co.,

- EAST HAMPTON.—East Hampton Corporation owner of vessel.
- EDITH.—System, I. W. T. Co., 1,000; w. l., 600, 706, 800.
- EDMORE.—Controlled by R. C. A.
- EDWARD L. DOHENT.—System, R. C. A. v. t. telegraph; w. l., 600, 706, 750, 800, 900.
- EGREMONT.—System, Navy—Marconi, 1,000; w. l., add 800.
- EL COSTON.—System, R. C. A. v. t. telegraph; w. l., 600, 706, 750, 800, 900; hours, X.
- E. L. DOHENT, THIRD.—Name changed to F. H. Wickett.
- ELKBORN.—W. l., 600, 706, 800.
- EL LAGO.—W. l., add 800.
- EL SOL.—W. l., 600, 706, 800.
- EMMA ALEXANDER.—Range, 300; system, F. T. Co. arc and F. T. Co., 1,000; w. l., 600, 706, 800, 1,800, 2,100, 2,400; controlled by F. T. Co.
- E. R. STERLING.—Range, 150; w. l., 600, 706.
- EUGENE V. R. THAYER.—System, R. C. A. v. t. telegraph; w. l., 600, 706, 750, 800, 900.
- FIRE BOAT No. 31.—W. l., 119.
- FIRE BOAT No. 44.—W. l., 119.
- FRANK G. DRUM.—W. l., 600, 706, 800.
- FRANKLIN K. LANE.—W. l., strike out 750.
- FRANK LYNCH.—System, Cutting & Washington, 1,000; w. l., 600, 706, 800.
- G. N. WILSON.—W. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.
- GULF OF VENEZUELA.—W. l., 600, 706, 800.
- GULFSTATE.—W. l., 600, 706, 800, 1,800, 2,100, 2,400.
- HARRY FARNUM.—W. l., 450, 600, 706, 800.
- HARRY YATES.—W. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.
- HELEN.—Range, 300; system, Navy, 1,000; w. l., 600, 706, 800.
- HERMOSA.—W. l., 600, 706, 800.
- H. F. ALEXANDER.—Range, 150-300; system, F. T. Co. arc and F. T. Co., 1,000; w. l., 600, 706, 800, 1,800, 2,100, 2,400; controlled by F. T. Co.
- HOG ISLAND.—Controlled by I. W. T. Co.
- HOMESTEAD.—System, Navy—Marconi, 1,000; w. l., add 800.
- HOXBAR.—System, Navy—R. C. A., 1,000; w. l., 600, 706, 800.
- HULVER.—Mobile Towing & Wrecking Co. owner of vessel; controlled by R. C. A. (U. S. L.).
- JACOB T. KOPP.—W. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.
- JAMESTOWN.—System, R. C. A. v. t. telegraph; w. l., 600, 1,800.
- JOHN J. BOLAND.—W. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.
- JOSEPH D. WOOD.—System, Navy—W. S. A. Co., 1,000.
- JUVIGNY.—W. l., 600, 706, 800; rates, 8 cents per word.
- LAKE FLORIAN.—W. l., 600, 706, 800.
- LASSEN.—W. l., 600, 706, 800.
- LAURENTIAN.—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; service, PG; hours, X; rates, 8 cents per word; controlled by R. C. A.
- LAVADA.—Controlled by R. C. A. (U. S. L.).
- LEVIATHAN.—System, R. C. A. v. t. telegraph and Western Electric v. t. telegraph; w. l., 600, 706, 750, 800, 900, 1,800, 1,900, 2,000, 2,100, 2,400.
- LIBERATOR.—W. l., 450, 600, 706, 800; controlled by R. C. A.
- LIBERTY BELL.—Controlled by R. C. A. (U. S. L.).
- LIBERTY LAND.—Export S. S. Corporation owner of vessel; controlled by I. W. T. Co.
- LIGONIER.—W. l., 600, 706, 800.
- LOUIS R. DAVIDSON.—W. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.
- MAGMERIC.—Controlled by I. W. T. Co. (U. S. L.).
- MANOA.—System, R. C. A., 1,000; w. l., 600, 706, 800.
- M. A. REEB.—W. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.
- McKEESPORT.—System, Marconi, 1,000; w. l., 450, 600, 706, 800.
- MEDINA.—System, Marconi, 1,000; w. l., 600, 706, 800.
- M. F. ELLIOTT.—System, R. C. A. v. t. telegraph; w. l., 450, 600, 706, 750, 800, 900; Standard Oil Co. of New Jersey owner of vessel.

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- MONTANAN.—Range, 200; system, F. T. Co., 1,000; w. l., 600, 706, 800; American-Hawaiian S. S. Co., owner of vessel.
- MULTNOMAH.—Charles R. McCormick Lumber Co. owner of vessel.
- NIAGARA.—W. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.
- NILE.—Controlled by R. C. A.
- NOBLES.—W. l., add 800; Export S. S. Co. owner of vessel; controlled by I. W. T. Co.
- OAKSPRING.—W. l., add 800.
- ODUNA.—System, Federal arc with chopper; w. l., 600, 706, 800, 2,100, 2,400.
- OLEUM.—System, K. & C., 1,000; w. l., 600, 706.
- ONONDAGA.—W. l., 600, 706, 750, 800, 1,800, 1,900, 2,100, 2,400.
- PALLAS.—System, Navy-Marconi, 1,000; w. l., add 800; James Griffiths & Sons owner of vessel.
- PAUL H. HARWOOD.—Range, 200; system, R. C. A. v. t. telegraph; w. l., 600, 706, 750, 800, 900.
- PAULSPORO.—System, R. C. A. v. t. telegraph; w. l., 600, 706, 800, 900.
- PRESIDENT TAFT.—W. l., 600, 706, 800, 2,100, 2,400; controlled by owner of vessel.
- QUEEN (WGX).—System, F. T. Co., 1,000; controlled by F. T. Co.
- RIOCO No. 1.—Richfield Oil Co. owner of vessel.
- SACANDAGA.—Controlled by R. C. A.
- SAN MATEO.—W. l., 600, 706, 800.
- SANTA CLARA.—Name changed to Columbian; American-Hawaiian S. S. Co. owner of vessel.
- SCHODACK.—W. l., 600, 706, 800.
- SCHOHARIE.—Carolina S. S. Corporation owner of vessel; controlled by I. W. T. Co. (U. S. L.).
- S. M. SPALDING.—System, R. C. A. v. t. telegraph; w. l., 600, 706, 750, 800, 900.
- STEEL INVENTOR.—W. l., 600, 706, 800.
- SUBBURY.—W. l., 600, 706, 800.
- SUNDANCE.—W. l., 450, 600, 706, 800; Carolina Steamship Corporation owner of vessel.
- SUNOIL.—System, R. C. A. v. t. telegraph; w. l., add 800.
- SUNUGENTCO.—W. l., 600, 706, 800.
- SUREMICO.—W. l., 600, 706, 800.
- SUTERMCO.—W. l., 600, 706, 800.
- TAMIAHUA.—W. l., 600, 706, 800.
- THEODORE H. WICKWIRE, JR.—W. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.
- VINITA.—W. l., 600, 706, 800.
- VIRGINIA.—System, Marconi, 1,000; w. l., 600, 706, 800.
- VIRGINIA EXPRESS.—Eastern Steamship Lines owner of vessel.
- VIRGINIA LIMITED.—Eastern Steamship Lines owner of vessel.
- WALTER JENNINGS.—W. l., 450, 600, 706, 800.
- WAPAMA.—Charles R. McCormick Lumber Co. owner of vessel.
- WELLINGTON.—W. l., 600, 706, 800.
- WEST CADRON.—W. l., 600, 706, 800.
- WEST ERRAL.—W. l., 600, 706, 800.
- WEST HIMROD.—Controlled by R. C. A.
- WEST KEATS.—W. l., 600, 706, 800; controlled by F. T. Co.
- WEST TOTANT.—Controlled by R. C. A.
- WILLIAM T. ROBERTS.—W. l., 715, 800, 875.
- WINONA.—Export Steamship Co. owner of vessel; controlled by I. W. T. Co.
- WINSTON-SALEM.—W. l., 600, 706, 800; controlled by I. W. T. Co. (U. S. L.).
- YALE.—W. l., 600, 706, 800.
- YOUNGSTOWN.—Controlled by R. C. A.
- Strike out all particulars of the following-named vessels: *Comanche, East Hampton, Puritan, Sea Monarch, Sebonac, Sir Thomas Shaughnessy.*

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

KYQ, read Cytheria; WBA, read Columbian; WROO, read F. H. Wickett; strike out all particulars following the call signals KDFZ, KDN, KDQU, KEP,

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, 1925]

- KFOB (Phoenix, Ariz.).—Power, 100.
 KFCY (Le Mars, Iowa).—Call signal changed to KWUC.
 KFGD (Chickasha, Okla.).—Call signal changed to KOCW.
 KFJZ (Fort Worth, Tex.).—Owner of station, Southwestern Baptist Theological Seminary.
 KFOB (Burlingame, Calif.).—W. l., 226; fy. kc., 1,330.
 KFPG (Los Angeles, Calif.).—Power, 500.
 KFQA (St. Louis, Mo.).—Power, 50.
 KFQH (Burlingame, Calif.).—Call signal changed to KFOB.
 KFQU (Holy City, Calif.).—W. l., 217.3; fy. kc., 1,380.
 KFQZ (Hollywood, Calif.).—Power, 50.
 KFUM (Colorado Springs, Colo.).—Owner of station, W. D. Corley, Cascade Avenue.
 KFUS (Oakland, Calif.).—W. l., 256; fy. kc., 1,170.
 KVVH (Manhattan, Kans.).—Power, 15.
 KFWI (South San Francisco, Calif.).—W. l., 226; fy. kc., 1,330; address, 205 Wiley B. Allen Building, San Francisco, Calif.
 KFWV (Portland, Oreg.).—Power, 50.
 KFVB (Big Bear Lake, Calif.).—Power, 500.
 KHQ (Seattle, Wash.).—Changed to Spokane, Wash., power, 500.
 KJBS (San Francisco, Calif.).—W. l., 220; fy. kc., 1,360.
 KLS (Oakland, Calif.).—W. l., 252; fy. kc., 1,200.
 KOCH (Omaha, Nebr.).—Power, 250.
 KPO (San Francisco, Calif.).—Power, 1,000.
 KNRC (Hollywood, Calif.).—Change to Los Angeles, Calif.
 KQW (San Jose, Calif.).—Power, 500; w. l., 231; fy. kc., 1,390; owner of station, First Baptist Church.
 KRE (Berkeley, Calif.).—W. l., 256; fy. kc., 1,170.
 KTAB (Oakland, Calif.).—Power, 1,000.
 KUO (San Francisco, Calif.).—W. l., 250; fy. kc., 1,200.
 KZM (Oakland, Calif.).—W. l., 240; fy. kc., 1,250.
 WABQ (Haverford, Pa.).—Power, 100.
 WABX (Mount Clemens, Mich., near).—Power, 500.
 WBT (Charlotte, N. C.).—Owner of station, Charlotte Chamber of Commerce (C. C. Coddington).
 WCAR (San Antonio, Tex.).—Power, 500.
 WCEE (Elgin, Ill., near).—Owner of station, Liberty Weekly.
 WDBE (Atlanta, Ga.).—W. l., 270; fy. kc., 1,110.
 WDBY (Chicago, Ill.).—Call signal changed to WPCC.
 WEAJ (Vermillion, S. Dak.).—Call signal changed to KUSD.
 WGAZ (South Bend, Ind.).—Call signal changed to WSBT.
 WGBC (Memphis, Tenn.).—W. l., 278; fy. kc., 1,080.
 WGHP (Detroit, Mich.).—Power, 1,500.
 WGR (Buffalo, N. Y.).—Owner of station, Federal Radio Corporation (Federal Telephone Manufacturing Corporation).
 WGY (Schenectady, N. Y.).—Power, 5,000.
 WHAZ (Troy, N. Y.).—Power, 1,000.
 WHBR (Cincinnati, Ohio).—Address, 1745 Reading Road.
 WHK (Cleveland, Ohio).—Owner of station, Radio Air Service Corporation, 1031 Winton Hotel.
 WIBI (Flushing, N. Y.).—Power, 50; address, 49 Boorum Avenue.
 WKAR (East Lansing, Mich.).—Owner of station, Michigan State College.
 WLS (Chicago, Ill.).—Changed to Crete, Ill.; power, 1,500.
 WOAI (San Antonio, Tex.).—Power, 2,000.
 WODA (Paterson, N. J.).—Power, 250.
 WOQ (Kansas City, Mo.).—Power, 1,000.
 WOWL (New Orleans, La.).—Power, 10.
 WSAI (Mason, Ohio).—Power, 5,000 only.
 WSBC (Chicago, Ill.).—Power, 500.
 WTAS (Elgin, Ill. (near)).—Call signal changed to WIIR; owner of station

RADIO SERVICE BULLETIN

Strike out all particulars following the call signals KFAN (Moscow, Idaho); KFCC (Helena, Mont.); KPNU (Santa Rosa, Calif.); KFOL (Marengo, Iowa); KFRL (Grand Forks, N. Dak.); KFRU (Bristow, Okla.); KFSY (Helena, Mont.); KPUS (Virginia, Minn.); KQP (Hood River, Oreg.); WABA (Lake Forest, Ill.); WBBG (Mattapoisett, Mass.); WCBU (Arnold, Pa.); WCM (Austin, Tex.); WCTS (Worcester, Mass.); WGBG (Thrifton, Va.); WHBB (Stevens Point, Wis.); WIBD (Joliet, Ill.); WIBP (Meridian, Miss.); WIBT (New York, N. Y.—portable); WMU (Washington, D. C.); WSAC (Clemson College, S. C.); WTHS (Flint, Mich.).

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, 1925, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

JUNEAU, ALASKA.—W. I., add 600; service, PG; hours, 8 a. m.—8 p. m.; rates, ship service, 6 cents per word.

KETCHIKAN, ALASKA.—W. I., add 600; service, PG; hours, N; ship service, 6 cents per word.

Strike out all particulars of the following-named stations: Fort Niagara, N. Y., Fort Porter, N. Y.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

Strike out all particulars following the call signals WUD and WUE.

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, 1925]

CHICAGO, ILL. (9XN).—Changed to Arlington Heights, Ill.

NEW YORK, N. Y. (2XAV—portable).—Changed to Monmouth County, N. J. (portable).

Strike out all particulars of the following-named stations: Auburn, Ala. (5XA); Bozeman, Mont. (7XB); Cherrydale, Va. (3XD); Chicago, Ill. (9XO); College Station, Tex. (5XAU); East Cleveland, Ohio (8YD); Lexington, Va. (3YK); Lincoln, Nebr. (9XBN); Mattapoisett, Mass. (1XAL); Minneapolis, Minn. (9XI); Missoula, Mont. (7XA); New Haven, Conn. (1XH); Newton, Mass. (1XK); New York, N. Y. (2XT); Norman, Okla. (6XW); Philadelphia, Pa. (3XAT); Portland, Oreg. (7XAD); Portland, Oreg. (7XI); Rainbow, Mont.—near Great Falls (7XO); St. Croix Falls, Wis. (9XBJ); Seattle, Wash. (7XU); State College, N. Mex. (5XD); Thompson Falls, Mont. (7XN); Walla Walla, Wash. (7XAB); Washington, D. C. (3XAA).

CHANGE IN CAPE HENRY (VA.) LIGHT STATION FOG SIGNAL

About December 1 next the characteristic of this fog signal will be changed to groups of 2 dots and 1 dash for 1 minute, silent 2 minutes:

.. — .. — etc.	Silent
60 seconds.	120 seconds.

RADIO FOG SIGNAL TO BE ESTABLISHED AT MANITOU (MICH.) LIGHT STATION

This station, located on the south shore of Lake Superior, Keweenaw Point, in 0.87° 35' 13", N. 47° 25' 11", will transmit radio fog signals during thick or foggy weather on 1,000 meters; also daily in clear weather from 9 to 9.30 a. m. and from 3 to 3.30 p. m., ninetieth meridian time. Characteristic: Sounds every 150 seconds; a group of two dashes repeated for 60 seconds; silent 90 seconds, thus:

— — — — — etc.	Silent
60 seconds.	90 seconds.

This station will not maintain radio communication service.

RADIO FOG SIGNAL TO BE ESTABLISHED AT DEVILS ISLAND (WIS.) LIGHT STATION

This station, located at the west end of Lake Superior in $0.90^{\circ} 43' 41''$, N. $47^{\circ} 04' 47''$, will transmit radio fog signals during thick or foggy weather on a wave length of 1,000 meters; also daily in clear weather from 9 to 9.30 a. m. and from 3 to 3.30 p. m., ninetieth meridian time. Characteristic: Sounds every 120 seconds; a group of three dashes; repeated for 60 seconds; silent 60 seconds, thus:

----- etc.	Silent
60 seconds	60 seconds.

This station will not maintain radio communication service.

RADIOCOMPASS INSTALLED ON VESSELS

The vessels *Republic* (KSN) and *J. A. Campbell* have been equipped with radio compass (direction finder).

NEW RADIO FOG SIGNAL TO BE ESTABLISHED AT CREAC'H POINT LIGHT STATION, FRANCE

The radio fog signal at Creac'h Point Light Station, in (approximately) $0.5^{\circ} 07' 48''$, N. $48^{\circ} 27' 36''$, has been discontinued. A new radio fog signal to be made on a 1,000-meter wave length will shortly be established in lieu of the old signal. The period will be 90 seconds, as follows:

The letter "C" transmitted during.....	15 seconds.
Long dashes transmitted during.....	30 seconds.
The letter "C" transmitted during.....	15 seconds.
Silent.....	30 seconds.

GRAA DYB LIGHT VESSEL (DENMARK) FOG SIGNAL ESTABLISHED

This vessel, located in (approximately) $0.8^{\circ} 05' E.$, N. $55^{\circ} 20'$, call signal OUX, wave length 600 meters, now operates a radio fog signal in conjunction with the submarine fog bell. By observing the time of the coincidence of the two signals, ships may determine approximately the distance of the light vessel, when this is 12 miles or less, in addition to obtaining the bearing. The fog signal consists of the Morse letter G (— — .) followed by 12 dots at intervals of 1.3 seconds, as described below. The submarine fog bell referred to is sounded three times every 20 seconds. The radio fog signal is transmitted every minute, the dot of the characteristic — — . being sent simultaneously with the first stroke of the fog bell. The number of dots (1 to 12) received when the sound of the submarine bell coincides is the distance of the light vessel in miles (approximately). Thus, if the tenth dot is received simultaneously with the first stroke of the submarine bell, it is equivalent to 10 miles.

Example of radio fog signal:

— —	Silent
18.6 seconds	41.4 seconds.

The radio fog signal is not operated when the station is required for ordinary radiotelegraphy.

HOURS OF OPERATION OF POLA (ITALY) STATION

The hours of operation of the coast station Pola, for service with ships, has been provisionally fixed as follows: 4-6.30, 9-12.30, 14-17, 20.30-23, G. M. T. The advice to navigators at 5.30 and 20.30 G. M. T. and the information relative to mines at 6.30 will be transmitted on the wave length of 1,000 meters.

NAME OF SPITSBERGEN STATION CHANGED

The group of islands of Spitsberg and Bjornoya since August 14 last form a part of the Kingdom of Norway, under the name Svalbard; consequently the name of the coast station Spitsbergen has been replaced by that of Svalbard.

IMPROVED APPARATUS FOR FREQUENCY MEASUREMENT

Much of the work of the radio laboratory of the Bureau of Standards during the past two years has had to do with the improvement of frequency standards and measurement methods. Incidental to this work a number of instruments have been developed which may be found of general utility. Instruments directly concerned in the work of measuring distant station frequencies or in the maintenance of the constancy of transmitting station frequencies have been dealt with in past announcements, the most recent ones being in the August and October numbers of the Radio Service Bulletin. The instruments described here are less directly useful but none the less important in the work of maintaining broadcasting stations on their correct frequencies. They were designed primarily for use by the Department of Commerce radio inspectors as standards. With instruments available for accurate and rapid frequency measurement there should result a material improvement in the interference situation in so far as it may be due to frequency variations.

One of the instruments referred to is a portable frequency meter for frequencies from 1,500 to 15,000 kilocycles (200 to 20 meters). The frequency meter is a simple series combination of capacity and inductance with a thermogalvanometer connected to the circuit by fixed inductive coupling. Four coils are used to cover this frequency range. The condenser has plates of such shape as to give a uniform frequency spacing over the whole scale.

Another instrument is a portable piezoelectric oscillator. This utilizes an application of the work in piezoelectricity briefly described in the October, 1924, and July, 1925, numbers of the Radio Service Bulletin. This outfit is a simple electron-tube apparatus with an inductance shunted by a variable capacity in the plate circuit, and a quartz plate arranged to be connected either between grid and filament or between grid and plate. The function of the quartz plate is to control the frequency of the circuit solely by the natural frequency of mechanical vibration of the quartz plate. The apparatus is small and inexpensive, requiring only a single receiving tube operated by dry batteries.

Another one of these instruments is a portable auxiliary generator of radio frequencies adapted for use with the piezo oscillator for frequency meter calibration. It may also be used, together with a receiving set, for frequency measurements of distant transmitting stations. It supplies voltages for measurement work with very low power at frequencies from 18 to 12,000 kilocycles (17,000 to 25 meters). It, like the piezo oscillator, uses a single receiving tube, operated by dry batteries.

Persons desiring to construct or procure any of the foregoing instruments can secure copies of the specifications therefor from the Bureau of Standards. These are, respectively, "Specifications for portable frequency meter for frequencies from 1,500 to 15,000 kilocycles, Type K"; "Specifications for portable piezo oscillator, Type N"; and "Specifications for portable auxiliary generator, Type O." The bureau has also prepared a set of directions for the use of the latter two instruments. This is Bureau of Standards Letter Circular 183, "Directions for use of the piezo oscillator and auxiliary generator for calibration of a radio frequency meter." It may be obtained upon application addressed to the Bureau of Standards, Washington, D. C., by persons having actual use for it.

RECENT RADIO PUBLICATIONS OF THE BUREAU OF STANDARDS

All publications that have been issued describing radio work of the Bureau of Standards are listed in a mimeograph pamphlet obtainable from that bureau on application, entitled "Letter Circular 40, Radio publications of the Bureau of Standards." This pamphlet lists both the papers printed by the Government and those published in various technical periodicals. A number of publications in the latter class, issued so recently as not to be included in the latest revision of Letter Circular 40, are mentioned here. A description of the general work in radio carried on by the bureau is given in an article "Solving the mysteries of radio," by two members of the bureau's radio laboratory, published in the Federal Employee, volume 10, page 12, of September, 1925. A discussion of one of the prevalent types of broadcast interference, the whistle or beat type, is given in the article, "When broadcast stations interfere," published in Radio Broadcast, volume 7, page 586, September, 1925; the article explains the cause of this interference and describes the means that are being employed to overcome it. A paper, "Application of radio transmission phenomena to the problems of atmospheric electricity" is given in abstract in the Bulletin of the National

Research Council, volume 10, part 3, number 53, page 61, July, 1925. This paper describes the importance of radio research and the availability of short waves in the study of the atmospheric and other conditions of the upper atmosphere. A paper entitled "Concerning the nature of fading," was published in Radio News, volume 7, page 270, September, 1925. This paper relates the facts known regarding the irregular variations of received signal intensity known as fading, discusses the causes, and indicates the means employed to determine the nature of this serious limitation of radio transmission. These papers published in non-Government periodicals are, of course, not obtainable from the Government, but may be consulted in the public libraries and other places maintaining periodical files.

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. There may be many other stations maintaining their frequency just as constant as these, but these are the only ones among those observed. 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 Standards, Department of Commerce, Washington, D. C.

Station	Owner	Location	Assigned frequency (kilo-cycles)	Period covered by measurements (months)	Number of times measured	Deviations from assigned frequencies noted in measurements	
						Average	Greatest since Sept. 20, 1925
WQL.....	Radio Corporation of America.	Coram Hill, Long Island, N. Y.	17.13	10	68	Per cent 0.2	Per cent 0.3
NBS.....	U. S. Navy	Annapolis, Md.	17.40	26	190	.2	.1
WCL.....	Radio Corporation of America.	Berkegat, N. J.	17.95	8	43	.1	.4
WGG.....	do.	Tuckerton, No. 1, N. J.	18.36	26	204	.2	.2
WIL.....	do.	New Brunswick, N. J.	21.80	6	52	.1	.5
WBT.....	do.	do.	22.60	6	30	.2	.2
WVA.....	U. S. Army	Annapolis, Md.	100.00	7	86	.2	.4
WJR.....	Jewett Radio & Phonograph Co.	Pontiac, Mich.	590.00	1	6	.0	.0
WCK.....	Detroit Free Press	Detroit, Mich.	610.00	10	77	.0	.0
WEAF.....	American Telephone & Telegraph Co.	New York, N. Y.	610.00	10	77	.0	.0
WCAP.....	Chesapeake & Potomac Telephone Co.	Washington, D. C.	640.00	25	111	.1	.2
WRC.....	Radio Corporation of America.	do.	640.00	22	101	.1	.0
WEB.....	Atlanta Journal	Atlanta, Ga.	700.00	25	111	.2	.4
WGY.....	General Electric Co.	Schenectady, N. Y.	700.00	28	145	.1	.1
WBZ.....	Westinghouse Electric & Manufacturing Co.	Springfield, Mass.	900.00	18	56	.1	.2
KDKA.....	do.	East Pittsburgh, Pa.	970.00	25	184	.1	.2

REFERENCES TO CURRENT RADIO PERIODICAL 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 the professional radio engineers which have recently appeared in technical periodicals. 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," Circular No. 138, a copy of which may be obtained for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. Further information about these lists, availabilities of previous lists and of the several periodicals is contained in the extended statement preceding the early lists and published in the Radio Service Bulletin prior to April, 1923, and also in May and September, 1923.

R100.—Radio principles

- R110 Taylor, A. H., and Hulbert, E. O. Wave propagation at high frequencies. *QST*, 2, pp. 12-21, October, 1925.
- R110 Lardry. Nouvelle contribution a l'etude de la propagation des ondes. *L'Onde Electrique*, 4, pp. 358-370, September, 1925.
- R113.8 Pickard, G. W. The effect of the solar eclipse of January 24, 1925, on radio reception (with bibliography). *Proceedings of the Institute of Radio Engineers*, 13, pp. 539-569, October, 1925.
- R116 Further discussion on "A method of measuring very short radio wave lengths and their use in frequency standardization," by E. W. Dunmore and F. H. Engel. *Proceedings of the Institute of Radio Engineers*, 13, pp. 647-650, October, 1925.
- R120 Schriever, O. Circuit arrangement for wireless signaling. United States Patent No. 1556130, issued October 6, 1925.
- R124 Brenner, I. M. Radioantenna. United States Patent No. 1554328, issued September 22, 1925.
- R124 Willoughby, J. A. Loop antenna. United States Patent No. 1555345, issued September 29, 1925.
- R124 Gorayeb, A. S. Portable antenna. United States Patent No. 1556435, issued October 6, 1925.
- R124 Shallock, D. H. Support for radioantenna. United States Patent No. 1556725, issued October 13, 1925.
- R125.1 Green, E. The polar curves of reception for spaced aerial systems. *Experimental Wireless (London)*, 2, pp. 828-837, October, 1925.
- R125.1 Smith-Rose, R. L. The effect of wave damping in radio direction finding. *Journal Institution of Electrical Engineers (London)*, 63, pp. 623-631, September, 1925.
- R125.6 Post Office beam station (Bridgewater, England). *Wireless World & Radio Review*, 17, pp. 454-456, October 7, 1925.
- R125.6 Beam direction finding—recent developments—new Marconi station at the South Foreland—use of plane reflectors. *Electrician (London)*, 95, pp. 295-297, September 11, 1925.
- R125.6 Moulton, A. B. Radio receiving system. United States Patent No. 1556122, issued October 6, 1925.
- R127 Morcross, K. B. How antenna characteristics affect reception. *Radio (San Francisco)*, 7, pp. 20-21, October, 1925.
- R129 Hammond, J. H., Jr. Electrical antenna. United States Patent No. 1557048, issued October 13, 1925.
- R131 Kipping, N. V., and Blumlein, A. D. The selection of valve characteristic curves and their significance.
- R133 Brillouin, L., and Fromy, E. Les circuits poly-ondes. *L'Onde Electrique*, 4, pp. 371-382, September, 1925.
- R133 Bethenod, J. Etude d'un circuit oscillant soumis a l'action de deux forces electromotrices harmoniques. *L'Onde Electrique*, 4, pp. 394-396, September, 1925.
- R133 Lange, Ch. Sur la generation d'oscillations polyphasées au moyen de tubes électroniques. *L'Onde Electrique*, 4, pp. 395-398, September, 1925.
- R134 Freeman, H. M. Detecting characteristics of electron tubes. *Proceedings of the Institute of Radio Engineers*, 13, pp. 611-623, October, 1925.
- R134.75 Round, H. J. Reception of wireless signals. United States Patent No. 1556129, issued October 6, 1925.
- R135 Sandeman, E. K., and Kipping, N. Distortion in wireless telephony and related applications of the cathode-ray oscillograph (bibliography appended). *Experimental Wireless (London)*, 2, pp. 811-820, October, 1925.
- R138 Appleton, E. V. Unsolved valve problems. *Wireless World & Radio Review*, 17, pp. 423-425, September 30, 1925.
- R144 Clayton, J. M. High-frequency resistance standards. *QST*, 2, pp. 25-28, October, 1925.
- R150 Press, A. Hysteretic generation of electromagnetic waves. United States Patent No. 1554231, issued September 22, 1925.

R200.—Radio measurements and standardization

- R200 Edgeworth, K. E., and Cobbold, G. W. N. The measurement of frequency and allied quantities in wireless telegraphy. *Journal Institution of Elec. Engrs. (London)*, 63, pp. 919-922, September, 1925.
- R204.2 Obata, J., and Yoshida, Y. On the valve method of measuring small motion with special reference to the precise recording of sounds, pressure variations, and vibrations. *Report of Aeronautical Research Inst.-Tokyo Imperial University*, August, 1925.
- R214 McGown, D. B. A quartz crystal oscillator. *Radio (San Francisco)*, 7, pp. 33-34, October, 1925.

RADIO SERVICE BULLETIN

R300.—Radio apparatus and equipment

- R330.5 Respondek, G. Connection for vacuum tubes. United States Patent No. 1555757, issued September 29, 1925.
- R330 The coming age of the thermionic valve. *Wireless World & Radio Review*, 17, pp. 415-416, September 30, 1925.
- R330 Metcalf, H. E. Vacuum tube. United States Patent No. 1555111, issued October 29, 1925.
- R330 Fleming, J. A. The thermionic valve. *Wireless World & Radio Review*, 17, pp. 417-423, September 30, 1925.
- R330 Valve data (British). *Wireless World & Radio Review*, 17, p. 426, October, 1925.
- R330 Valves we have tested. *Wireless World & Radio Review*, 17, pp. 430-431, October, 1925.
- R330 New R. C. A. tubes. *QST*, 8, pp. 40-41, October, 1925.
- R330 Leblanc, C. L. A. M. Electron tube. United States Patent No. 1555677, issued September 29, 1925.
- R330.4 Warner, J. C., and Pike, O. W. The application of the X-L filament to power tubes. *Proceedings of the Institute of Radio Engineers*, 13, pp. 589-609, October, 1925.
- R331 Langmuir, I. Electrical discharge apparatus and process of preparing and using the same. United States Patent No. 1558435, issued October 20, 1925.
- R331 Langmuir, I. Electrical discharge apparatus. United States Patent No. 1558437, issued October 20, 1925.
- R331 James, W. Valves in the making. *Wireless World & Radio Review*, 17, pp. 435-442, September 30, 1925.
- R333 White, W. C. Life testing of tungsten filament triodes. *Proceedings of the Institute of Radio Engineers*, 13, pp. 625-647, October, 1925.
- R342 Horle, L. C. F., and Heyman, N. Shock-proofing mounting means for vacuum tubes. United States Patent No. 1554501, issued September 22, 1925.
- R342.15 Chadwick, R. H. Transformers and reactors in radio sets. *QST*, 8, pp. 37-39, October, 1925.
- R342.6 Turner, P. K. Selective amplifiers (radio-frequency). *Experimental Wireless (London)*, 2, pp. 801-809, October, 1925.
- R342.6 Hull, L. M. A true cascade radio-frequency amplifier. *QST*, 8, pp. 8-11, October, 1925.
- R342.7 Harris, S. The four types of audio-frequency amplification. *Radio News*, 7, pp. 620-623, November, 1925.
- R343 Lynch, A. H. The radio broadcast "Aristocrat." *Radio Broadcast*, 5, pp. 28-31, November, 1925.
- R343 Batcher, R. R. Short wave receivers. *QST*, 8, pp. 33-36, October, 1925.
- R343 Thatcher, E. W. A crack 40-80 meter set. *Radio News*, 7, p. 605, November, 1925.
- R343 A simple 200-600 meter receiver. *QST*, 8, pp. 46-47, October, 1925.
- R343 Rowe, G. C. B. New designs in radio receivers. *Radio News*, 7, pp. 608-609, November, 1925.
- R343.7 Cockaday, L. M. How to build the Raytheon plate supply unit. *Popular Radio*, 8, pp. 405-414, November, 1925.
- R343.7 Millen, J. An a. c. receiver and power amplifier (4-tube set with a. c. supply). *Radio Broadcast*, 5, pp. 57-62, November, 1925.
- R348 Seaman, W. G. Two-way repeater and amplifier. United States Patent No. 1558063, issued October 20, 1925.
- R350 Gradenwitz, A. Plastic radio by the Kluth system. *Radio News*, 7, p. 601, November, 1925.
- R360 Ruddy, P. J. Radio receiver. United States Patent No. 1554598, issued September 22, 1925.
- R360 Simpson, F. G. Radio-receiving system. United States Patent No. 1558120, issued October 20, 1925.
- R374 Miller, V. T. Crystal detector for wireless receiving sets. United States Patent No. 1554540, issued September 22, 1925.
- R376.3 Minton, J. P. Limitations of horn-type loud-speaker. *Radio (San Francisco)*, 7, pp. 18-19, October, 1925.
- R377 Chireix, H. Electric relay. United States Patent No. 1558144, issued October 20, 1925.
- R381 Clinker, R. C. Electrical apparatus. United States Patent No. 1554713, issued September 22, 1925.
- R381 Priess, W. H. Variable electrical condenser. United States Patent No. 1556233, issued September 29, 1925.
- R381 Priess, W. H. Electrical condenser. United States Patent No. 1556252, issued September 29, 1925.
- R381 Priess, W. H. Machine and method for building electrical condenser stacks. United States Patent No. 1557724, issued October 20, 1925.
- R381 Proctor, J. A. Variable electrical condenser. United States Patent No. 1557725, issued October 20, 1925.
- R381 Priess, W. H. Electrical condenser. United States Patent No. 1558043, issued October 20, 1925.
- R381 Nobbs, G. H. Variable condenser. United States Patent No. 1557316, issued October 13, 1925.
- R381 Cohen, S. Variable condenser. United States Patent No. 1553634, issued September 29, 1925.
- R381 Priess, W. H. Electrical condenser. United States Patent No. 1555261, issued September 29, 1925.
- R381 Proctor, J. A. Electrical tuning apparatus. United States Patent No. 1556254, issued September 29, 1925.
- R382 Press, A. Uniquely resonant coil. United States Patent No. 1554232 issued September 22, 1925.
- R384.1 Griffin, E. E. A detecting, oscillating, and modulating radiocast wavemeter. *Radio (San Francisco)*, 7, pp. 29-30, October, 1925.
- R386 Mathes, R. C. Electric circuits. United States Patent No. 1557860, issued October 20, 1925.
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