

DEPARTMENT OF COMMERCE**RADIO SERVICE BULLETIN**

ISSUED MONTHLY BY RADIO DIVISION

Washington, July 30, 1927—No. 124

CONTENTS

	Page	Miscellaneous—Continued.	Page
Abbreviations.....	1	Fog signal established on Orna Dyb (Den-	
New stations.....	2	mark) light vessel.....	9
Alterations and corrections.....	4	Fog signal established on Horns Rev (Den-	
Miscellaneous:		mark) light vessel.....	10
Vessels equipped with a radio compass....	5	Change in fog signal of Anticosti (Canada)	
Changes in radiobeacon stations.....	7	light vessel.....	10
General public service discontinued by		Change in time of transmission of weather	
Pensacola (Fla.) naval station.....	7	bulletins by Eiffel Tower (France) sta-	
Use of radio by vessels prohibited while in		tion.....	10
ports of Spain.....	7	Change in transmission of weather bullet-	
Ship rate for United States vessels changed.	7	ins by St. Paolo (Italy) station.....	10
New list of radio stations of the United		Procedure in regard to aircraft in distress	
States.....	7	over the English Channel.....	10
Radio inspector's badge lost.....	8	List of broadcasting stations of Canada... 10-12	
Amended regulations governing the issuance of radio operators' licenses.....	9	Constant frequency stations.....	12
		Standard frequency stations.....	14
		References to current radio literature.....	15

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. AB = Aviation beacon. B = Beacon P = Private. O = Government business exclusively.
Hours	= Hours of operation: N = Continuous service. X = No regular hours.
F. T. Co.	= Federal Telegraph Co.
I. R. T. Co.	= Intercity Radio Telegraph Co.
I. W. T. Co.	= Independent Wireless Telegraph Co.
K. & C.	= Kilbourne & Clark Manufacturing Co.
R. C. A.	= Radio Corporation of America.
T. R. T. Co.	= Tropical Radio Telegraph Co.
U. R. Corp.	= Universal Radio Corp.
W. S. A. Co.	= Wireless Specialty Apparatus Co.
C. w.	= Continuous wave.

RADIO SERVICE BULLETIN

- Kc. = Kilocycles.
- Fy. = Frequency.
- A. c. = Alternating current.
- V. t. = Vacuum tube.
- U. S. L. = Applies only to the List of Commercial and Government Radio Stations of the United States.

This is the first supplement to the June 30, 1927, edition of the List of Commercial and Government Radio Stations of the United States.

NEW STATIONS

Commercial land stations, alphabetically, by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Bernese bureau]

Station	Call signal	Wave lengths	Service	Hours	Station controlled by—
Dapitan, P. I. (Zamboanga Province) ¹	KZDN	609-1,400.....	PG		Philippine Insular Government.
Flagstaff, Ariz. ²	KGGC	147.....	FX	X	Lowell Observatory.
Flagstaff, Ariz. (portable) ²	KGGD	147.....	FX	X	Do.
Guadalupe, Calif. ³	RIU	107.1.....	FX	X	Paramount Famous Players-Lasky Corporation.
Lone Pine, Calif. ⁴	KQS	45.77.....	FX	X	City of Los Angeles, Department of Power and Water.
Los Angeles, Calif. ⁵	KQT	45.77.....	FX	X	Do.
Newark, N. J. ⁶	WKI	17.5, 27.9.....	FX	X	F. T. Co.
Palo Alto, Calif. ³	KKC	17, 27.5.....	FX	X	Do.
Point Barrow, Alaska ⁷	KGGB	650, 125, 700, 800.....	FX	X	Whitworth Fisheries.

¹ Loc. 123° 25' 22" E., 8° 25' 22" N.; range, 400; system, F. T. Co. a-c; hours, 7:30 a. m.-12 noon, 2-4:30 p. m., daily; 9-11 a. m. Sundays and holidays; ship service first 10 minutes of each hour; rates, 6¢ per word.
² System, composite v. t. telephone and telegraph.
³ System, composite v. t. telephone.
⁴ System, composite v. t. telegraph.
⁵ System, composite v. t. telegraph.
⁶ Loc. (approximately), 74° 16' 00" W., 40° 44' 00" N.; system, F. T. Co. v. t. telegraph.
⁷ Loc. (approximately), 122° 09' 30" W., 37° 28' 00" N.; system, F. T. Co. v. t. telegraph. System, composite, 1,000.

Commercial ship stations, alphabetically, by names of vessels

[Additions to the List of Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Bernese bureau]

Name of vessel	Call signal	Range	Service	Hours	Owner of vessel	Station controlled by—
Chilcoop.....	KGGE	5	PG	X	Chico S. S. Co.....	Owner of vessel.
Gar, Et. ¹	WOBN		P	X	Gar Wood.....	
Jolanda.....	WOPV				Moses Taylor.....	Do.
Sierra ²	KRW	5	PG	X	Carl J. Londeu.....	
Yacuda ³	KGFZ		P	X	Aaron Drey.....	Do.

¹ System, composite v. t. telegraph; w. l., 109-130, 600.
² Range, 200; system, Gray & Danielson, 200; w. l., 600, 700, 800.
³ System, composite v. t. telegraph; w. l., 113, 715.

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
KGFZ	Yacuda.....b	KQT	Los Angeles, Calif.....c
KGGB	Point Barrow, Alaska.....c	KQS	Lone Pine, Calif.....c
KGGC	Flagstaff, Ariz.....c	KRW	Sierra.....b
KGGD	Flagstaff, Ariz. (portable).....c	KZDN	Dapitan, P. I. (Zamboanga Province).....c
KGGE	Chilcoop.....b	WKI	Newark, N. J.....c
RIU	Guadalupe, Calif.....c	WOBN	Gar, Et.....b

RADIO SERVICE BULLETIN

3

Commercial airplane stations, alphabetically, by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Old Glory ¹	WRHP				William Randolph Hearst.

¹ This plane to be used in the New York to Rome flight.*Commercial airplane stations, alphabetically, by call signals*

[b, ship station; c, land station]

Name of station	Call signal
Old Glory.....	WRHP

Government land stations, alphabetically, by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Makapuu Point Light Station, Hawaii ¹ (Oahu Island).	WWEK	600, 700.....	G	X	Bureau of Lighthouses.

¹ System, composite v. l. telegraph; w. l., 600, 700.*Government ship stations, alphabetically, by names of stations*

[Additions to the List of Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Hawk.....	NAPS		O	N	U. S. Navy.
McPherson.....	WYCM	600, 700.....	O	N	U. S. Army.

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
NAPS	Hawk..... ^b	WYCM	McPherson..... ^b
WWEK	Makapuu Point Light Station, Hawaii (Oahu Island)..... ^c		

Special land stations, alphabetically, by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1927]

Station	Call signal	Wave length	Station controlled by—
Newark, N. J.....	2XBA	65.19.....	WAAM (Inc.), 7 Bond St.



RADIO SERVICE BULLETIN

Special land stations, grouped by districts

Call signal	District and station	Call signal	District and station
2XBA	Second district: Newark, N. J.	6XBE	Eighth district: San Diego, Calif.

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, 1927, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

Strike out all particulars of the following-named stations: Hoonah, Alaska; Rocky Point, N. Y. (WQL).

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, 1927, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

AMERICAN MERCHANT.—Station controlled by I. W. T. Co. (U. S. L.).
BEACONLIGHT.—Owner of vessel, National Bank of Commerce in New York.
BEACONHILL.—Owner of vessel, National Bank of Commerce in New York.
BELFLOWER.—Station controlled by R. C. A. (U. S. L.).
BULKO.—Name changed to C. B. Watson; owner of vessel, Sabine Towing Co.; station controlled by I. W. T. Co.
CAPILLO.—Station controlled by I. W. T. Co.
CHETOPA.—Station controlled by I. W. T. Co.
CITY OF ALTON.—Station controlled by I. W. T. Co.
CLARENCE A. BLACK.—Disregard particulars given in June 30 edition of this publication. Not equipped with transmitting apparatus.
COL. JAMES M. SCHOONMAKER.—Disregard particulars given in June 30 edition of this publication. Not equipped with transmitting apparatus.
COPPENAME.—W. l., add 800.
LAKE GAITHER.—Station controlled by R. C. A.
LIBERTY GLO.—Station controlled by R. C. A. (U. S. L.)
NEBRASKAN.—Owner of vessel, C. H. Sprague & Son.
SOUTHLANDS.—Station controlled by R. C. A.
RUSHVILLE.—Station controlled by I. W. T. Co. (U. S. L.).
VACOIL.—Owner of vessel, Vacuum Oil Co.
VAGABONDIA.—Name changed to Amphitrite; owner of vessel, John Vanneck; station controlled by R. C. A.
WEST HARSHAW.—Station controlled by I. W. T. Co. (U. S. L.).
WEST KEDRON.—Station controlled by I. W. T. Co.
WEST MAHOMET.—Station controlled by R. C. A. (U. S. L.).
YOUNGSTOWN (KIFX).—Station controlled by I. W. T. Co.
 Strike out all particulars of the following-named vessels: A. D. MacBeth, John A. Topping, Sialia.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KFTL, read Amphitrite; KTN, read C. B. Watson; strike out all particulars following the call signals, KDXN, KFO, KFXG, WFY, WQL.

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, 1927]

KFXB (Los Angeles, Calif.).—Call signal changed to KPLA.
KFXR (Oklahoma, Okla.).—Owner of station, Exchange Avenue Baptist Church.
KGFI (Fort Stockton, Calif.).—Changed to San Angelo, Tex.
KMED (Medford, Oreg.).—W. l., 249.9, fy. kc., 1,200.
KMMJ (Clay Center, Nebr.).—W. l., 379.5, fy. kc., 780.

RADIO SERVICE BULLETIN

5

- WAFD (Detroit, Mich.).—Power, 100; w. l., 340.7, fy. kc., 880.
 WAGS (Somerville, Mass.).—Changed to Lexington, Mass.; owner of station, J. Smith Dodge.
 WCAJ (Lincoln, Nebr.).—W. l., 379.5, fy. kc., 790.
 WDBK (Cleveland, Ohio).—Changed to Akron, Ohio; owner of station, W. F. Jones.
 WEHS (Evanston, Ill.).—Owner of station, Victor C. Carlson.
 WEMC (Berrien Springs, Mich.).—W. l., 483.6, fy. kc., 620.
 WGL (Philadelphia, Pa.).—Power, 1,000 day, 500 night.
 WGN (Chicago, Ill.).—Owner of station, The Tribune Co. and Liberty Weekly (Inc.); power, 500.
 WHBP (Philadelphia, Pa.).—Power, 500 day.
 WIAD (Philadelphia, Pa.).—Power, 100.
 WLIB (Elgin, Ill., near).—Owner of station, Liberty Weekly (Inc.) and The Tribune Co.; power, 15,000.
 WMBH (Joplin, Mo.).—No longer portable.
 WTHO (Detroit, Mich.).—Changed to Saginaw, Mich.; call signal changed to WMCO; owner of station, Wolverine Broadcasting Co.; w. l., 272.6, fy. kc., 1,100.
 WTMJ (Milwaukee, Wis.).—Power, 1,000.
 Strike out all particulars of the following-named stations: KFLR (Albuquerque, N. Mex.); KROX (Seattle, Wash.).

COMMERCIAL AIRPLANE 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, 1927, and to the International List of Radiotelegraph Stations, published by the Berne Bureau]

Strike out all particulars of the following-named stations: America, Josephine Ford, unnamed, Yorktown.

COMMERCIAL AIRPLANE STATIONS, ALPHABETICALLY, BY CALL SIGNALS

Strike out all particulars following the call signals: KFZC, KNN, WKBK, WTW.

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, 1927, and to the International List of Radiotelegraph Stations, published by the Berne Bureau]

- Bethel, Alaska.—W. l., 455; service, FX.
 Bellefonte, Pa.—Station controlled by Bureau of Lighthouses.
 Bryan, Ohio.—Station controlled by Bureau of Lighthouses.
 Cheyenne, Wyo.—Station controlled by Bureau of Lighthouses.
 Circle, Alaska.—W. l., 789, 874.1, 1,743; service, FX; hours, X.
 Cleveland, Ohio.—Station controlled by Bureau of Lighthouses.
 Concord, Calif.—Station controlled by Bureau of Lighthouses.
 Copper Center, Alaska.—W. l., 408.3; service, FX; hours, X.
 Craig, Alaska.—W. l., 450.2, 485.1, 624.6; service, FX.
 Elko, Nev.—Station controlled by Bureau of Lighthouses.
 Fairbanks, Alaska.—W. l., 3,702.
 Fort Benning, Ga.—Loc. (approximately), 84° 50' 00" W., 32° 30' 00" N.
 Fort Egbert, Alaska.—W. l., 440.3, 700.5; service, FX; hours, X.
 Fort St. Michael, Alaska.—W. l., 459.8.
 Fort Sill, Okla.—Hours, N.
 Fortuna, Alaska.—W. l., 529.7.
 Fort Gibbon, Alaska.—W. l., 499.7, 571.1.
 Grundler, Alaska.—W. l., 464.8.
 Guam, Mariana Island.—W. l., strike out 2,254.
 Holy Cross, Alaska.—W. l., 469.9.
 Hot Springs, Alaska.—W. l., 545.1.
 Iditarod, Alaska.—W. l., 700.5, 3,486, 5,552.
 Iowa City, Iowa.—Station controlled by Bureau of Lighthouses.
 Juneau, Alaska.—W. l., strike out 600, 800; hours, X.
 Ketchikan, Alaska.—W. l., 545.1, 1,874, 4,543; service, FX; hours, X.
 Kotzebue, Alaska.—W. l., 435.2.
 Little Squaw Mine, Alaska.—W. l., 670.7; hours, X.

New Brunswick N. J. (Hadley Field).—W. L., 3,156, 3,407; station controlled by Bureau of Lighthouses.
 Nome, Alaska.—W. L., 660.4, 3,612, 3,998, 4,100; service, FX.
 New York, N. Y. (NAH).—Hours, strike out.
 North Platte, Nebr.—W. L., 2,751, 3,407; station controlled by Bureau of Lighthouses.
 Nulato, Alaska.—W. L., 636.6.
 Omaha, Nebr.—W. L., 70.55, 2,585, 3,407; station controlled by Bureau of Lighthouses.
 Pensacola, Fla. (traffic station).—Service, O (effective September 1, 1927).
 Radio Test Car No. 1.—Station controlled by Department of Commerce, Radio Division.
 Reno, Nev.—W. L., 70.55; 3,407, 3,786; station controlled by Bureau of Lighthouses.
 Rock Springs, Wyo.—Station controlled by Bureau of Lighthouses.
 Ruby, Alaska.—W. L., 399.8.
 Sacramento, Calif.—Hours, X; station controlled by Bureau of Lighthouses.
 Salt Lake City, Utah.—Station controlled by Bureau of Lighthouses.
 San Francisco, Calif. (KFZP).—Station controlled by Bureau of Lighthouses.
 Schenectady, N. Y.—Strike out all particulars.
 Seward, Alaska.—W. L., 1,499, 2,499, 2,998; service, FX; hours, X.
 Tacotna, Alaska.—W. L., 559.4, 587.9.
 Tatoosh, Wash.—W. L., strike out 600.
 Tau, Samoa.—W. L., strike out.
 Valdez, Alaska.—W. L., 450.2; hours, X.
 Washington, D. C. (WWX).—Station controlled by Bureau of Lighthouses.
 Wiseman, Alaska.—W. L., 550.1.
 Yukon, Alaska.—W. L., 500.2, 610.5.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

Strike out all particulars following the call signals: NUXB, WWS.

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, 1927]

Lakewood, N. J. (2XBH).—Changed to Coney Island, N. Y. (Brooklyn); address 183 Vermont Street, Brooklyn, N. Y.
 Maywood, Ill. (9XR).—Station controlled by Bureau of Lighthouses.
 Villanova, Pa. (3XAU).—Strike out all particulars.

MISCELLANEOUS

VESSELS EQUIPPED WITH A RADIO COMPASS

The following-named commercial vessels, which are equipped with transmitters for communication, have also been equipped with a radio compass (direction finder): *Algonquin* (KDKH), *Alleghany*, *Aloha*, *Alpena*, *City of Cleveland III*, *City of Detroit III*, *Conneaut*, *Dorchester*, *Eastern States*, *Fairfax*, *Iroquois*, *J. L. Reiss*, *John A. Kling*, *Jonancy*, *Mana*, *Octorara*, *Tionesta*, *Venus*, *Western States*, *William A. Reiss*, *William K. Field*, *Wyandotte*; the following-named, which are not equipped for communication purposes, have been equipped with a radio compass: *Alexander McDougall* (Pittsburgh S. S. Co.), *Cornell* (Pittsburgh S. S. Co.), *Denmark* (Great Lakes S. S. Co.), *D. D. G. Kerr* (Pittsburgh S. S. Co.), *E. C. Collins* (Pittsburgh S. S. Co.), *George G. Crawford* (Pittsburgh S. S. Co.), *J. F. Darston* (Great Lakes S. S. Co.), *John B. Cowle* (Great Lakes S. S. Co.), *John W. Boardman* (Huron Transp. Co.), *Leonard B. Miller* (Columbia S. S. Co.), *McGivray Shiras* (Pittsburgh S. S. Co.), *Pentecost Mitchell* (Pittsburgh S. S. Co.), *Queen City* (Pittsburgh S. S. Co.), *Samuel F. B. Morse* (Pittsburgh S. S. Co.), *Sir William Siemens* (Pittsburgh S. S. Co.), *William B. Schiller* (Pittsburgh S. S. Co.), *William D. Crawford* (Virginia S. S. Co.), *William E. Corey* (Pittsburgh S. S. Co.), *William J. Olcott* (Pittsburgh S. S. Co.); the vessel *Cumberland*, owned by the U. S. Army, which is not equipped for communication, has been

RADIO SERVICE BULLETIN

7

CHANGES IN RADIOBEACON STATIONS

Winter Quarter Shoal Lightship, Va.—A radiobeacon has been established on this lightship. It will transmit continuously during thick or foggy weather and each day during clear weather from 12 to 12.30 and 6 to 6.30 a. m. and p. m. on 1,000 meters, every 180 seconds, groups of 3 dashes and 1 dot, repeated for 60 seconds, silent 120 seconds, thus:

----- . ----- . etc.	Silent
60 seconds	120 seconds

The radio operator will stand watch for the first 15 minutes of each hour from 8 a. m. to 9.15 p. m. during clear weather and from 10 to 10.15 a. m. and from 4 to 4.15 p. m. in thick or foggy weather, at which intervals the radiobeacon will not be operated. Call signal, WWAX.

Passage Island Light Station, Mich.—The hours of operation for this beacon are 2 to 2.30 and 8 to 8.30 a. m. and p. m., 90th meridian time, during clear weather and continuously during thick or foggy weather. This station does not maintain radio communication service.

Makapuu Point Light Station, Hawaii (Oahu Island).—A radiobeacon has been established at this light station. It will transmit daily in clear weather from 10.30 to 11 a. m. and from 3.30 to 4 p. m. and for the third 15 minutes of each hour from 7.30 p. m. to 6.45 a. m., on 1,000 meters every 180 seconds, groups of 4 dashes repeated for 60 seconds, silent 120 seconds, thus:

----- ----- etc.	Silent
60 seconds	120 seconds

GENERAL PUBLIC SERVICE DISCONTINUED BY PENSACOLA (FLA.) NAVAL STATION

Effective September 1, next, the naval traffic station at Pensacola, Fla., will discontinue handling general public service traffic. Only official business will be handled.

USE OF RADIO BY VESSELS PROHIBITED WHILE IN PORTS OF SPAIN

Use of radiotelegraphic and radiotelephonic stations is prohibited for ships of all classes during their stay in Spanish roadsteads, bays, and ports without express authorization to that effect. Exception is made for cases of shipwreck or necessities of navigation.

As regards warships visiting Spanish ports after having obtained the necessary authorization through diplomatic channels, permission to use radio stations should be requested at the same time consent is asked for the projected visits.

In cases of enforced arrival captains of ports may grant or refuse the said authorization according to the attending circumstances of the foreign warships that find themselves obliged to enter the port.

SHIP RATE FOR COAST GUARD VESSELS CHANGED

Effective September 1, 1927, the general public ship rate for vessels of the United States Coast Guard will be 8 cents per word for all services.

NEW LIST OF RADIO STATIONS OF THE UNITED STATES

The June 30, 1927, edition of the list of Commercial and Government Radio Stations of the United States will be ready for distribution by the Superintendent of Documents, Government Printing Office, Washington, D. C., about September 15, next. The price of this publication is 15 cents per copy, including postage.

This list includes all commercial and Government land and ship stations, broadcasting stations, and experimental and training-school stations.

The list of Amateur Radio Stations of the United States, edition June 30, 1927, will be ready for distribution by the Superintendent of Documents about October 1, next. This list includes all amateur stations and experimental and training-school stations.

Do not make remittances to the Radio Division of the Department of Com-

RADIO INSPECTOR'S BADGE LOST

During an inspection trip from Atlanta, Ga., through the States of Florida and Tennessee, an inspector lost his Department of Commerce radio inspector badge No. 10. Should this badge be found, its return to the Department of Commerce, Radio Division, Washington, D. C., will be greatly appreciated.

AMENDED REGULATIONS GOVERNING THE ISSUANCE OF RADIO OPERATORS' LICENSES

(1) *Commercial extra first class.*—To be eligible for examination an applicant for this class of license must have held a commercial first-class license and must have been actually engaged as an operator at stations open to public correspondence for at least 18 months during the two years previous to his application.

A speed in transmission and reception of at least 30 words per minute, Continental Morse Code, and 25 words per minute, American Morse Code, five characters to the word, must be attained.

The questions in this examination will be considerably wider in scope than those used for commercial first-class licenses. A percentage of at least 80 will constitute a passing mark.

Holders of licenses of this class are authorized to operate any licensed radio station.

(2) *Commercial first class.*—Applicants for this class of license must pass a code test in transmission and reception at a speed of at least 20 words per minute in Continental Morse Code (five characters to the word).

The practical and theoretical examination shall consist of comprehensive questions under the following headings:

- (a) Experience.
- (b) Diagram of receiving and transmitting apparatus.
- (c) Transmitting apparatus.
- (d) Receiving apparatus.
- (e) Operation and care of storage batteries.
- (f) Motors and generators.

(g) International Regulations governing radio communication, and the United States Radio Laws and Regulations.

A percentage of 75 will constitute a passing mark for this class of license.

Holders of this class of license are authorized to operate any licensed radio station.

(3) *Commercial second class.*—Applicants for this class of license must pass a code test in transmission and reception at a speed of at least 12 words per minute in Continental Morse Code (five characters to the word).

The practical and theoretical examination will cover the same subjects as required for the first-class license.

A percentage of 65 will constitute a passing mark.

Holders of this class of license are authorized to operate only licensed radio stations not open to general public correspondence. This fact should be indicated by having all licenses of this class bear across their face, preferably in red, the following restriction: "This license not valid for the operation of any general public service station."

Applicants desiring to operate broadcasting stations only will be given an examination pertaining specifically to broadcasting apparatus. The licenses so issued will indicate this limitation by showing across their face, preferably in red, the following restriction: "This license valid only for the operation of a broadcasting station."

(4) *Operator permits.*—In special cases where no interference with communications of other stations is involved, consideration will be given to applications for the operation of particular stations, without technical examination.

(5) *Amateur license.*—Applicants for this grade of license must pass a code test in transmission and reception at a speed of at least 10 words per minute in Continental Morse Code (five characters to the word).

An applicant must pass an examination which will develop knowledge of the adjustment and operation of the apparatus which he desires to use and of the international regulations and acts of Congress in so far as they relate to interference with other radio communications and impose duties on all classes of operators.

A percentage of 70 will constitute a passing mark.

This license is valid for the operation of licensed amateur radio stations only.

RADIO SERVICE BULLETIN

9

(6) *Temporary amateur license.*—Amateurs who can not be examined at time of application may be given temporary licenses valid for the operation of a particular station until such time as examination for a regular license can be held, but not to exceed a period of one year.

(7) *Renewals.*—1. Commercial extra first class: These licenses may be renewed without examination, provided the record shows 12 months' satisfactory service in a land or ship station open to general public service, at least 6 months of which must have been during the last 12 months of the license period. Holders of these licenses employed as radio inspectors, radio instructors, or in similar occupations requiring exceptional qualifications where the duties require the testing, or demonstrating, or otherwise using commercial radio apparatus and the telegraph codes may be issued renewals of their licenses without examination, provided such employment has covered a period of 18 months out of the two-year license period. Where the applicant has not regularly used the telegraph codes he will be given the code examination as for an original license, and if he has used only one code, he will be examined in the code not used.

2. Other renewals: Renewal licenses may be issued to operators of other classes without examination, provided the operator has had three months' satisfactory service during the last six months of the license term. One year satisfactory service out of two years of the license term may be accepted for renewal at the discretion of the examining officer.

3. Holders of commercial first-class radio operator licenses who have not had sufficient service at commercial stations to permit the unconditional renewal of such licenses, but indicate satisfactory service at broadcasting stations for the length of time necessary for renewal and are unable to pass the required code test or to present themselves for a code test, may be issued restricted renewals of their existing licenses. The licenses so issued should bear across their face, preferably in red, the following restriction: "This license not valid for the operation of any limited or general public service station."

Holders of commercial second-class radio operator licenses who have passed the regular commercial second-class examination but have not had sufficient service at stations regularly using the Continental Code to permit unconditional renewal of such licenses, but indicate satisfactory service at broadcasting stations for the length of time necessary for renewal but are unable to pass the required code test or to present themselves for a code test may be issued restricted renewals of their existing licenses. The licenses so issued should bear across their face, preferably in red, the following restriction: "This license not valid for the operation of any limited or general public service station."

Applicants holding restricted commercial operators' licenses or broadcast operators' licenses may be issued renewals of such licenses provided the service records indicate three months' satisfactory service during the last six months of the license term. One year satisfactory service out of the two-year term of the license may be accepted at the discretion of the examining officer. Renewal commercial-class licenses so issued shall bear the indorsement "This license not valid for the operation of any limited or general public station," and renewal broadcast licenses should bear the indorsement "Valid only for the operation of a broadcasting station."

Applicants who have passed the regular commercial examination, but who hold renewal licenses indorsed "This license is not valid for the operation of any limited or general public service station," may be issued unconditional renewals of such licenses, provided they have the required service as indicated above and pass the code test required by the regulations for the class of license held by them.

(8) *Reexamination.*—No applicant who fails to qualify will be reexamined within three months from date of the previous examination. All examination papers, except amateur, whether the applicant qualifies or not, will be forwarded to the Department of Commerce, Radio Division, for filing.

FOG SIGNAL ESTABLISHED ON GRAA DYB (DENMARK) LIGHT VESSEL

A radio fog signal has been established on this light vessel, located in the North Sea in latitude 55° 20' N., longitude 8° 05' E. (approximately). The signal will consist of the transmission of the Morse letters GD (— — . — .) followed by 15 dots (.) every two minutes on 1,025 meters, c. w. The commencement of every fourth submarine fog signal (— — .) will be transmitted simultaneously with the last dot of the radio fog signal D (— .).

RADIO SERVICE BULLETIN

11

List of broadcasting stations of Canada—Continued

Call signal	Owner of station	Location of station	Wave length (meters)	Frequency (kilocycles)	Power input to antenna (watts)
CFCY	The Island Radio Co.....	174 Kent Street, Charlottetown, Prince Edward Island.	312.3	950	10
CFQC	The Brant Radio Supply Co. (Ltd.).	92-95 Colborne Street, Arcade Building, Brantford, Ontario.	290.9	1,010	50
CFJC	N. S. Dargie & Sons and Weller & Weller.	186 Victoria Street, Kamloops, British Columbia.	267.7	1,120	15
CFLC	Radio Association of Prescott.	Victoria Hall, Prescott, Ontario.	266.0	1,015	50
CFMC	Monarch Battery Co.....	Montreal Street, Kingston, Ontario.	267.7	1,120	20
CFNB	James S. Noll & Sons (Ltd.).	212 Waterloo Row, Fredericton, New Brunswick.	247.8	1,210	25
CFQC	The Electric Shop (Ltd.).	1122 Guler Street, Saskatoon, Saskatchewan.	329.5	910	500
CFRB	Standard Radio Manufacturing Corporation (Ltd.).	Lot 70, township of King, York County, Ontario.	291.1	1,030	1,000
CFRC	Queen's University (Department of Electrical Engineering).	Fleming Hall, Queen's University, Kingston, Ontario.	267.7	1,120	500
CFYC	International Bible Students Association.	2243 Royal Oak Avenue, Burnaby, British Columbia.	410.7	720	500
CHCS	The Hamilton Spectator....	Spectator Building, Hamilton, Ontario.	340.7	860	10
CHCY	International Bible Students Association.	Lots 19-23, Block 46, King Edward Park, Edmonton, Alberta.	516.9	580	250
CHGS	R. T. Holman (Ltd.).....	Holman Building, Summerside, Prince Edward Island.	267.7	1,120	25
CHIC	Northern Electric Co. (Ltd.) (uses Station CKNC, Canadian National Carbon Co., Toronto, Ontario).	Hillcrest Park, Toronto, Ontario.	356.9	840	500
CHMA	Christian & Missionary Alliance.	6618-105A Avenue, Edmonton, Alberta.	516.9	580	250
CHNC	Toronto Radio Research Society (uses Station CKNO, Canadian National Carbon Co., Toronto, Ontario).	Hillcrest Park, Toronto, Ontario.	356.9	840	500
CHNS	Northern Electric Co. (Ltd.).	Carlton Hotel, corner Prince and Argyle Streets, Halifax, Nova Scotia.	323.4	930	100
CHPC	Central Presbyterian Church (uses Station CRCD, Vancouver Daily Province, Vancouver, British Columbia).	Vancouver, British Columbia.	410.7	720	1,000
CHRC	E. Fontaine.....	120 Dolbeau Street, Quebec, Quebec.	340.7	860	5
CHSC	H. N. Stevia and Radio Sales.	Main Street, Unity, Saskatchewan.	267.7	1,120	50
CHUC	International Bible Students Association.	Corner Avenue D and Twenty-sixth Street, Saskatoon, Saskatchewan.	329.5	910	500
CHWC	H. H. Williams & Sons (Ltd.).	Corner Hamilton Street and Eleventh Avenue, Regina, Saskatchewan.	312.3	950	15
CHYC	Northern Electric Co. (Ltd.).	121 Shearer Street, Montreal, Quebec.	410.7	720	260
CJBC	Jarris Street Baptist Church (uses one of the stations in Toronto city or district).	Toronto, Ontario.....	291.1 326.0	1,000 840	500
CJBR	Saskatchewan Cooperative Wheat Producers (Ltd.) (uses Station CKCK, Leader Publishing Co. (Ltd.), Regina, Saskatchewan).	Regina, Saskatchewan.....	312.3	950	500
CJCA	The Edmonton Journal (Ltd.).	Journal Building, Edmonton, Alberta.	516.9	580	500
CJCI	Radio Service & Repair Shop.	Eighteenth Avenue and Seventh Street east, Calgary, Alberta.	434.5	690	250
CJCU	E. R. Streeter.....	Washington and James Streets, Mission City, British Colum-	247.8	1,210	5

List of broadcasting stations of Canada—Continued

Call signal	Owner of station	Location of station	Wave length (meters)	Frequency (kilocycles)	Power input to antenna (watts)
CJGX	The Winnipeg Grain Exchange.	Yorkton, Saskatchewan.....	475.9	630	500
CJOR	G. C. Chandler.....	Block 20, Sea Island, British Columbia.	291.1	1,020	50
CJRM	Ins. Richardson & Sons (Ltd.).	337 Grogan Street, west, Moose Jaw, Saskatchewan.	290.9	1,010	50
CJSC	The Evening Telegram (uses Station CKCL, The Dominion Battery Co. (Ltd.), Toronto, Ontario.)	Toronto, Ontario.....	350.0	840	500
CJWC	Wheaton Electric Company (Ltd.).	Thirty-third Street and Avenue C north, Saskatoon, Saskatchewan.	320.5	910	250
CJYC	Universal Radio of Canada (Ltd.).	Scarboro Station, Ontario.....	291.1	1,020	500
CKAC	La Presse Publishing Co. (Ltd.).	Corner St. James Street and St. Lawrence Boulevard, Montreal, Quebec.	410.7	720	1,200
CKCD	Vancouver Daily Province..	142 Hastings Street, west, Vancouver, British Columbia.	410.7	720	1,000
CKCF	Le "Soleil" (Ltd.).....	120 Dolbeau Street, Quebec, Quebec.	340.7	850	250
CKCK	Leader Publishing Co. (Ltd.).	Regina, Saskatchewan.....	312.3	960	500
CKCL	The Dominion Battery Co. (Ltd.).	20 Trinity Street, Toronto, Ontario.	290.9	840	500
CKCO	Dr. G. M. Gilbert (for Ottawa Radio Association).	232 Somerset Street, west, Ottawa, Ontario.	434.5	690	100
CKCV	G. A. Vandry.....	69 St. Joseph Street, Quebec, Quebec.	340.7	850	50
CKCW	Gooderham & Worts (under construction).	Bowmanville, Ontario.....	312.3	960	5,000
CKCX	International Bible Students Association of Canada (uses Station CJYC, Universal Radio of Canada (Ltd.), Scarboro Station, Ontario).	Scarboro Station, Ontario.....	291.1	1,020	500
CKFC	United Church of Canada...	Corner Thurlow and Pendrell Streets, Vancouver, British Columbia.	410.7	720	50
CKLO	Alberta Pacific Grain Co. (Ltd.).	Red Deer, Alberta.....	350.0	840	1,000
CKMC	R. L. MacAdam.....	Cobalt (west side), Ontario.....	247.8	1,210	5
CKNC	Canadian National Carbon Co. (Ltd.).	Dillcrest Park, Toronto, Ontario.	350.0	840	500
CKOC	Westworth Radio Supply Co. (Ltd.).	Royal Connaught Hotel, Harrington, Ontario.	340.7	850	50
CKPC	Wallace Huss.....	40 Buns Avenue, Esler Street, Preston, Ontario.	247.8	1,210	7½
CKPR	E. O. Swan.....	Midland, Ontario.....	267.7	1,120	50
CKSH	City of St. Hyacinthe, Quebec.	Blunder and Cascade Streets, St. Hyacinthe, Quebec.	312.3	960	50
CKSM	St. Michael's Cathedral (uses Station CPKS, Standard Radio Manufacturing Corporation (Ltd.), Toronto, Ontario).	Toronto, Ontario.....	291.1	1,020	1,000
CKUA	University of Alberta.....	Campus, University of Alberta, Edmonton, Alberta.	515.0	580	500
CKWX	A. Holstead and Wm. Hanlon.	100½ Granville Street, Vancouver, British Columbia.	410.7	720	10
CKY	Manitoba Telephone System.	Shorbrooke Street, Winnipeg, Manitoba.	284.4	780	500
CNRA	Canadian National Railways.	Moncton, New Brunswick.....	302.4	630	500
CNRC	Canadian National Railways (uses Station, CFAC, Calgary Herald, Calgary, or uses Station CFUN, W. W. Grant (Ltd.), Calgary).	Calgary, Alberta.....	434.5	690	500
CNRE	Canadian National Railways (uses Station	Edmonton, Alberta.....	515.0	580	500

RADIO SERVICE BULLETIN

13

List of broadcasting stations of Canada—Continued

Call signal	Owner of station	Location of station	Wave length (meters)	Frequency (kilo-cycles)	Power (input to antenna (watts))
CNRM	Canadian National Railways (uses Station CHYC, Northern Electric Co. (Ltd.), or uses Station CKAC, La Presse Publishing Co. (Ltd.), or uses Station CFCF, Canadian Marconi Co., Montreal, Quebec).	Montreal, Quebec.....	450.7	730	1,000-1,450
CNRO	Canadian National Railways.	Ottawa, Ontario.....	434.5	690	500
CNRQ	Canadian National Railways (uses Station CKGV, G. A. Vaudry, Quebec, Quebec).	Quebec, Quebec.....	345.7	580	50
CNRH	Canadian National Railways (uses Station CKOK, Leader Publishing Co. (Ltd.), Regina, Saskatchewan).	Regina, Saskatchewan.....	312.3	500	500
CMRS	Canadian National Railways (uses Station CFQC, Electric Shop (Ltd.), Saskatoon, Saskatchewan).	Saskatoon, Saskatchewan.....	329.5	510	500
CNRT	Canadian National Railways (uses Station CFOA, Star Printing & Publishing Co., Toronto, Ontario).	Toronto, Ontario.....	350.9	540	500
CNRV	Canadian National Railways.	Vancouver, British Columbia (Lulu Island).	291.1	1,050	500
CNRW	Canadian National Railways (uses Station CKY, Manitoba Telephone System, Winnipeg, Manitoba).	Winnipeg, Manitoba.....	354.4	750	500

July 8, 1927.

CONSTANT FREQUENCY STATIONS

The list of "constant frequency stations" given below supplements the list of "standard frequency stations." The transmitted waves from the stations in either list should be of value to the public as frequency standards because of their constancy and close adherence to the licensed values. The Bureau of Standards makes regular measurements of the transmitted frequencies of the standard frequency stations but not of the constant frequency stations. Each station included in the following list employs a special device for controlling or checking the frequency, the calibration of the device being in agreement with the bureau's frequency standards. The special device may be automatic piezo control, a piezo oscillator, piezo resonator, or frequency indicator. Stations not included in this list nor in the list of standard frequency stations, which use one or more of the special devices for frequency regulation, are invited to communicate with the Bureau of Standards, requesting a copy of Letter Circular 214, Requirements of Constant Frequency Stations.

This list is much shorter than usual this month because of the many changes in assigned frequencies. The stations listed are the only ones which have given the Bureau of Standards the necessary information on the means now employed to hold the newly assigned frequency in agreement with the bureau's frequency standards. More stations will be added to this list as soon as the Bureau of Standards has been satisfied that the various controlling and checking devices

Station	Owner	Location	Frequency	Wave length	Apparatus for frequency regulation
			Kilo-cycles	Meters	
WMAQ	Chicago Daily News.....	Chicago, Ill.....	670	447.5	Frequency indicator, type B, and piezo oscillator.
WJAD	Frank P. Jackson.....	Waco, Tex.....	670	447.5	Frequency indicator, type B.
WCCO	Washburn-Crosby Co....	St. Paul-Minneapolis, Minn.	740	405.2	Piezo oscillator.
WCAD	St. Lawrence University.	Canton, N. Y.....	820	365.6	Frequency indicator, type B.
WLS	Sears, Roebuck & Co....	Crete, Ill.....	870	344.6	Piezo oscillator.
WRAQ	Radio Corporation of Porto Rico.	San Juan, P. R.....	880	340.7	Frequency indicator, type B.
WBAA	Purdue University.....	West Lafayette, Ind.	1,100	272.6	Piezo oscillator.
WABQ	Keystons Broadcasting Co.	Philadelphia, Pa.....	1,150	260.7	Do.
KFVS	Hirsch Battery & Radio Co.	Cape Girardeau, Mo.	1,340	223.7	Frequency indicator, type B.

STANDARD FREQUENCY STATIONS

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

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

Station	Owner	Location	Assigned frequency	Period covered by measurements	Number of times measured	Deviations from assigned frequencies noted in measurements	
						Average	Greatest since June 25, 1927
			Kilo-cycles	Months		Per cent	Per cent
NBS	United States Navy.....	Annapolis, Md.....	17.60	14	67	0.2	0.1
WCI	Radio Corporation of America.	Tuckerton, N. J.....	17.95	28	119	.1	0
WSS	Do.....	Becky Point, N. Y.....	18.60	10	39	.1	0
WIL	Do.....	New Brunswick N. J.	21.80	27	147	.1	.1
WVA	United States Army.....	Annapolis, Md.....	160	26	204	.2	.3
NAA	United States Navy.....	Arlington, Va.....	112	21	160	.2	.1
WEAF	National Broadcasting Co.	New York, N. Y.....	610	31	174	0	0
WRC	Radio Corporation of America.	Washington, D. C.....	640	43	215	.1	0
WJZ	Do.....	Bound Brook, N. J....	660	14	53	.2	.3
WGY	General Electric Co....	Schenectady, N. Y.....	760	42	216	.1	0
WBZ	Westinghouse Electric & Manufacturing Co.	Springfield, Mass.....	900	37	97	.1	0
KDKA	Do.....	East Pittsburgh, Pa...	950	14	58	.1	.1
WHAL	Consolidated Gas, Electric Light & Power Co.	Olea Morris, Md.....	1,050	4	13	.1	.1

RADIO SERVICE BULLETIN

15

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

R000.—Radio communication

- R020 Davis, S. The laws of radio communication (book). Published by McGraw-Hill Co., 1927. Price \$3.
 R020 Ducati, A. La coda corta nelle comunicazioni radio-elettriche (book on short-wave communication). Publishers: Zanichelli, Bologna, Italy., 1927.

R100.—Radio principles

- R113 Rice, C. W. Short-wave radio transmission and its practical uses. QST, 11, pp. 8-14, June, and pp. 36-42, August, 1927.
 R113.8 Heed, J. F. Ditton Park research station: Apparatus that will be used during the eclipse for studying the propagation of waves and atmospherics. Wireless World and Radio Review, 29, pp. 749-42; June 15, 1927.
 R114 Kincaid, E. H. Correlating static and weather changes. Radio News, 9, pp. 110-112; August, 1927.
 R123.6 Fleming, J. A. Approximate theory of the flat projector aerial used in the Marconi beam system of wireless telegraphy. Experimental Wireless (London), 4, pp. 382-392; July, 1927.
 R134 Groeneveld, van der Pol, and Posthumus. Gittergleichrichtung. Jahrbuch der drahtlosen Telegraphie, 29, pp. 139-145; May, 1927.
 R134.78 Turner, P. K. Design and construction of a superheterodyne receiver. Experimental Wireless (London), 4, pp. 402-411; July, 1927.
 R134.8 Brennan, J. B. Have you a Roberts reflex? (changes which will rejuvenate the reflex). Radio Broadcast, 11, pp. 208-210; August, 1927.

R200.—Radio measurements and standardization

- R200 Edgrumbe, K. and Ockenden, F. B. J. Some recent advances in a. c. measuring instruments. Journal Institution Elec. Engrs. (London), 65, pp. 553-599; June, 1927.
 R200 Henney, K. Condenser, coil, antenna measurements. Radio Broadcast, 11, pp. 225-226; August, 1927.
 R201.6 Kutzman, J. A bridge to measure capacity, power factor, resistance, and inductance (Wien's series resistance bridge). QST, 11, pp. 15-20; July, 1927.
 R210 Scheibe, A. Zusammenfassender Bericht: Normalfrequenz und absolute Frequenzmessung. Jahrbuch der drahtlosen Telegraphie, 29, pp. 108-162; May, 1927.
 R210 The exact and precise measurement of wave length in radio transmitting stations (continued from June issue). Experimental Wireless (London), 4, pp. 394-401; July, 1927.

R300.—Radio apparatus and equipment

- R323 Reducing static at short waves (underground antennas). QST, 11, pp. 32-33; August, 1927.
 R330 Vacuum tube characteristics (CX-326, UX-229, UX-250, CX-280, etc.). Radio (San Francisco), 9, pp. 47-48; July, 1927.
 R330 Loughren, A. V. Use of tubes having high amplification (high- μ tubes). Radio Broadcast, 11, pp. 238-240; August, 1927.
 R331 Bartlett, A. C. The internal action and principles of design of thermionic valves. Experimental Wireless (London), 4, pp. 403-420; July, 1927.
 R342 Hairy, L. W. Better audio amplification for short wave receivers. QST, 11, pp. 15-20; August, 1927.
 R342 Shafer, A. G. Keying the amplifier. QST, 11, pp. 33-35; July, 1927.
 R342 Serogge, M. G. The performance of an intermediate frequency amplifier. Journal Institution Elec. Engrs. (London), 65, pp. 644-647; June, 1927.
 R342.6 Rhodes, H. E. Constructing a 5-tube neodyne (circuit for new A. C. tubes). Radio Broadcast, 11, pp. 222-234; August, 1927.
 R343 Sechtleber, R. Radio receiving system. United States Patent No. 1634962, issued July 5, 1927.
 R344.3 Hoffman, W. H. A constant frequency transmitter. QST, 11, pp. 36-40; July, 1927.
 R344.3 Hull, R. A. Some light on transmitter tuning. QST, 11, pp. 24-28; July, 1927.
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 R360 Oakley, H. D. Quantitative determination of radio receiver performance. Journal American Institute of Elec. Engrs., 46, pp. 568-72; June, 1927.
 R374 Tatham, G. H. Making synthetic galena. Wireless World & Radio Rev., 29, pp. 774-78; June 23, 1927.
 R376.3 Grötzschner, M., and Meyer, E. Eine Schallregistrier-Vorrichtung zur Aufnahme der Frequenzkurven von Telephonen und Lautsprechern. Elektrische Nachrichten Technik, 4, pp. 202-211; May, 1927.

- R334.1 Mauborgne, J. O., and Hill, G. Wavemeters. United States Patent No. 1632782, issued June 21, 1927.
 R334.1 Dent, H. B. For use on all wave lengths between 14 and 200 meters. Wireless World & Radio Review, 20, pp. 829-832; June 29, 1927.

R400.—Radio communication systems

- R402 Phelps, B., and Kruse, R. S. The $\frac{1}{2}$ -meter band officially opened. QST, 11, pp. 9-14; August, 1927.
 R402 Eckersley, T. L. Short-wave wireless telegraphy. Journal Institution Elec. Engrs. (London), 65, pp. 600-614; June, 1927.
 R402 Cuyler, E. M., and Austin, O. C. An investigation of the 5-meter band. QST, 11, pp. 29-30; July, 1927.
 R435 Zworykin, V. K. Wireless transmitting system. United States Patent No. 1634390, issued July 3, 1927.

R500.—Applications of radio

- R500 Millen, J. Saving paper (device operating with radio principles). Radio Broadcast, 11, pp. 199-202; August, 1927.
 R550 Eckersley, P. P. The distribution of broadcasting stations. Wireless World & Radio Review, 21, pp. 32-35; July 13, 1927.
 R550 Clement, E. E. Radio broadcast selecting and distributing system. United States Patent No. 1635132, issued July 5, 1927.
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 621.354.3 Best, O. M. ABC socket power for large tubes. Radio (San Francisco), 2, pp. 25-28; July, 1927.
 621.383.21 Grondahl, J. O. Electrical translating device. United States Patent No. 1634420, issued July 3, 1927.

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