

FOURTH ANNUAL REPORT
of the
FEDERAL RADIO COMMISSION

to the
CONGRESS OF THE UNITED STATES

For the Fiscal Year
1930



COMMISSIONERS

C. McK. SALTZMAN, *Chairman*

EUGENE O. SYKES, *Vice Chairman*

IRA E. ROBINSON

HAROLD A. LAFOUNT

WILLIAM D. L. STARBUCK

JAMES W. BALDWIN, *Secretary*



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1930

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FOURTH ANNUAL REPORT OF THE FEDERAL RADIO COMMISSION

FEDERAL RADIO COMMISSION,
Washington, D. C., December 1, 1930.

To the Senate and House of Representatives of the United States of America in Congress assembled:

Herewith is submitted the Fourth Annual Report of the Federal Radio Commission covering the fiscal year ending June 30, 1930.

PERMANENCY

From the creation of the Federal Radio Commission pursuant to the act approved February 23, 1927, until December 18, 1929, the commission existed as a temporary body with a date set from time to time when it would transfer its administrative duties to the Department of Commerce and become an appellate body with curtailed responsibilities. This temporary existence naturally imposed certain restrictions on the procurement of personnel, on the formation of plans and policies for the future and in other operations of the commission.

The establishment of the commission as a permanent body by the act approved December 18, 1929, removes the limitation referred to and places on that body full responsibility for the future development and upbuilding of excellent radio service for the country. The work being accomplished indicates that the commission appreciates this responsibility and will bring about the desired results gradually and effectively without violence to worthy services now existing.

The demand for frequencies for broadcasting, marine, "point-to-point," aviation, experimental, and many other purposes being already greater than the supply available, the future responsibilities of the permanent commission includes a demand for creative work through the development of plans and policies whereby a better and more extensive use may be made of the limited number of frequencies available.

PERSONNEL

The terms of all commissioners expiring February 23, 1930, the following commissioners were reappointed for the term of years shown below:

	Years
Maj. Gen. C. McK. Saltzman.....	6
Harold A. Lafount.....	5
William D. L. Starbuck.....	4
Eugene O. Sykes.....	3
Ira E. Robinson.....	2

On February 28, 1930, the following organization was effected by the commission:

Chairman.....	Maj. Gen. C. McK. Saltzman.
Vice chairman.....	Eugene O. Sykes.

A vacancy was created in the office of secretary of the commission by the unexpected resignation of Mr. Carl Butman, who had filled that position since November 2, 1927. The commission selected as the new secretary Mr. James W. Baldwin, then chief clerk of the Department of Justice.

The resignation on December 15, 1929, of the general counsel of the commission, Mr. Bethuel M. Webster, jr., caused a vacancy in that office, which was filled by the selection of Col. Thad H. Brown, then general counsel of the Federal Power Commission.

The act establishing the commission as a permanent body created the office of chief engineer. The commission selected for this office Dr. C. B. Jolliffe, then an official of the Bureau of Standards.

REORGANIZATION

The three divisions of the office through which practically all routine business passes, the license, legal, and engineering divisions, have, during the period covered by this report, been carefully reorganized with a view to a more speedy and efficient handling of routine business. During the year 8,543 applications for new services, for modification of existing services, or for the issue of licenses, were handled by these divisions, and 7,655 licenses and permits were issued. The records show that the average time elapsing between the receipt of applications and the final action on the same has been greatly reduced. The indications are that this time will be still further reduced, commencing September 1 of this year.

OFFICE REMOVAL

During the preceding year, the commission was located in the Interior Department Building. The commission realizes the inconvenience experienced by the department in allotting to the commission much valuable office space which was needed by the department. The commission desires to express its appreciation to the department for the many courtesies extended to the commission by the department while housed in its building. It was apparent, however, for many months, that the commission had outgrown its offices. The limited space available made it necessary in some cases for offices of one division to be widely separated and on different floors, this condition presenting difficulties in administration, and producing consequent delays. On July 8, 1930, the commission moved to the National Press Building, Fourteenth and F Streets NW., where additional space was obtained. This change can only result in more speedy administration and increased efficiency.

RADIOTELEPHONY

During the year the outstanding development in radiotelephony was the inauguration of a dependable radiotelephone service with the steamship *Leviathan* at sea connected through the land telephone sys-

tem whereby a person at any telephone station in the United States or Europe could speak to a person on that ship at sea. This remarkable radiotelephone achievement, developed by American genius, marks the beginning of a service which is being extended to many other ships.

Since 1927 a regular dependable trans-Atlantic radiotelephone service has been established for conversations between the United States and Europe. Recently, a similar service was opened between the United States and South America. Due to the success of the trans-Atlantic service, demands have been made upon the Federal Radio Commission for additional frequencies in order to give more reliable and additional service between the United States and Europe.

Due to the fact that marine radiotelephone services did not exist when the International Radiotelegraph Conference prepared the convention of 1927, and due to the lack of coordination in the assignment of frequencies suitable for such services, the Radio Commission has found itself greatly embarrassed in providing frequencies for this new radiotelephone use. To provide frequencies, the commission has, with the cooperation of Government departments and commercial operating agencies in this country, endeavored to prepare a new plan for the use of frequencies for maritime purposes which would not only provide for the continuance of existing services, but make available frequencies for these telephone services. This will result not only in providing space for telephone service, but also in a better organization of all maritime radio services.

AVIATION

The rapid growth of aviation in the United States has developed many trying problems for the commission. In its endeavor to assist in making aviation safer and more useful to the public, the commission has grappled with a difficult problem of providing adequate radio facilities for this rapidly growing service from the very limited number of useful frequencies available for this purpose. Many air transport companies are equipping aircraft with receivers to make use of the radio aids to navigation provided by the Department of Commerce and with equipment for 2-way communication between aircraft and ground. To make the most economical use of the few frequencies available, the commission, after a conference with representatives of the air transport companies, has prepared a new plan for the control of aviation communication.

INTERNATIONAL AVIATION RADIO-FREQUENCIES

For the purpose of enabling closer cooperation and the prevention of interference in aviation radio, a Canadian and United States delegation met informally in New York on April 10, 1930, and agreed upon recommendations which have since been adopted by both countries.

STATE QUOTAS

The amendment to the radio act of 1927, approved March 28, 1928, and generally referred to as the Davis amendment, requires that the Radio Commission " * * * shall as nearly as possible

make and maintain an equal allocation of broadcasting licenses, of bands of frequency or wave lengths, and of station power to each of said five zones * * * and shall make a fair and equitable allocation of licenses, wave lengths, time of operation, and station power to each of the States * * * within each zone according to population."

The demand from the various States for additional radio facilities is constantly increasing, while the number of frequencies available for this purpose remains fixed. This increasing demand from States for additional facilities has rendered it imperative that the commission establish just and proper standards for computing the value of facilities assigned to the various States.

On June 17, 1930, the commission adopted, after much study and discussion, General Order No. 92, specifying a unit value for radio broadcasting stations of various types, power, etc., by means of which units the value of the stations assigned to each State could be determined and thereby guide the commission in making "a fair and equitable allocation of licenses, wave lengths, time of operation, and station power to each of the States." Further details concerning this order and the equitable division of radio broadcasting facilities within the United States is set forth in the report of the chief engineer hereto appended.

INTERNATIONAL RELATIONS

The international radio convention and regulations are of the utmost concern to users of radio facilities in the United States. The assignment of frequencies to various classes of services and the rules, limitations, and restrictions on their use are necessarily based on the international convention and regulations. All users of radio, whether for communication, aviation, marine, experimental, or other purposes are therefore vitally interested in the results accomplished by international communication conferences. Existing conditions are based on the convention adopted by the International Radiotelegraph Conference of Washington of 1927. The next conference will take place in 1932 at Madrid.

The first meeting of the international technical consulting committee on radio communications authorized by the International Radiotelegraph Conference of 1927 took place at The Hague last fall. This meeting was attended by three official representatives from the Federal Radio Commission and, in addition to other official representation, by a large number of representatives from radio operating agencies in the United States. The results of the deliberations at The Hague were favorable to the United States.

A second meeting of the international technical consulting committee on radio communications will take place at Copenhagen in 1931. Many problems of vital interest to the users of radio in the United States will be considered at that meeting. The work at Copenhagen will have a direct bearing on the work to be done at the International Radiotelegraph Conference at Madrid in 1932.

In connection with the preparations for the above mentioned international conferences so vital to all radio services in this country, the Federal Radio Commission is desirous of making every effort to ascertain the needs and views of radio licensees and of extending all

possible assistance and cooperation to the Department of State under whose jurisdiction all operations pertaining to international communication are so efficiently conducted.

COOPERATION

The Radio Commission desires to express its appreciation of the assistance received during the past year from the radio division, the aeronautics branch and the Bureau of Standards, Department of Commerce, the Department of State, the War Department, Navy Department, and the Coast Guard, Treasury Department. The cooperation of these agencies has facilitated the work of the commission in many instances.

CODE OF PRACTICE AND PROCEDURE—EXAMINERS

While the work of the legal division and the major legal developments of the fiscal year have been rather fully considered in the part of this report devoted to that subject, certain of these are believed to be of special importance. On June 25, 1930, the commission adopted a code of practice and procedure governing the conduct of hearings before it. On the same date the commission made provisions for the appointment of one chief examiner and two attorney examiners who will conduct the hearings in all but exceptional cases. These two provisions are so closely associated and interrelated, not only as to date of enactment but as to cause and probable effect, that they will be considered together.

From the date of its organization the commission has been confronted with procedural difficulties which are not only very real but are not common to any other board or commission. Radio was in a period of transition, passing from the experimental stage to that of commercial adaptation. Certain provisions of the radio act had not been construed by courts of last resort, and there was not only a lack of precedent upon which to build but also an absence of even an apt analogy. In short, the commission was beset on every hand with new and novel problems such as would be expected to arise in the administration of a law only recently enacted which had for its purpose the regulation of a business which, while it already directly affected a relatively large part of the entire public, was in a state of rapid development. It was necessary, under the circumstances, to make certain compromises and to rely to a large degree upon the not too satisfactory system of trial and error.

With no tried and established system of procedure, the commission did not feel justified in delegating the authority to conduct hearings to its subordinates, even though it was manifest at the outset that the commission could not actually conduct all hearings required to be held by it and give full and sufficient consideration to other important problems.

The experiences of the past three and one-half years have, however, been such as to lead to the adoption during the year of a codified system of practice and procedure and to make possible the conduct of hearings by examiners, provided for by the original act, but only recently appointed.

While no extravagant claims are made for the system of procedure thereby established, and it is fully recognized that the period of trial and error is not at an end, it is confidently believed and expected that beneficial results will be attained and that a step has been taken which, if followed by proper cooperation on the part of persons having business with the commission, will inure to the benefit of all and to a more effective administration of the provisions of the act.

AMENDMENT TO SECTION 16, RADIO ACT OF 1927

An event of equal or paramount importance was the passage by Congress during the fiscal year and the approval by the President on July 1, 1930, of an amendment to the appellate provisions (sec. 16) of the radio act of 1927. The need for such an amendment, although generally recognized for some time, had only recently been of great practical importance.

EXPERIMENTATION IN HIGH FREQUENCIES

The International Radio Conference of 1927 assigned bands of frequencies between 10 and 23,000 kilocycles to the use of the various radio services then existing. The channels between these limits thus became the supply of useful working frequencies for the entire world. Above 23,000 there exists a wide band of very high frequencies whose characteristics and usefulness are not definitely known and which offers a fruitful field for experimentation. The Radio Commission has constantly endeavored to encourage experimentation in this field in the hope of enlarging the number of useful channels in the world's supply. Several agencies have been granted licenses for experiment stations in this band in order that they may determine the conditions under which it may be used.

RECOMMENDATIONS

1. It is recommended that the Federal Radio Commission be authorized to compel the painting and illumination of radio towers, if, in its judgment, such towers constitute a menace to air navigation.
2. It is recommended that the Virgin Islands, Porto Rico, Alaska, and the Hawaiian Islands be not included in zones, as now provided under the provisions of the Davis amendment, and that their quotas of radio facilities be separate and independent of the facilities allotted to continental United States.
3. It is recommended that authority be given the commission to suspend a radio license for a period of not to exceed 30 days for infractions of the law, regulations, or orders. Under the existing law, the only corrective measure possible to the commission is the complete revocation of the license or the refusal to renew the same. Many of the infractions of the law, regulations, or orders do not warrant a complete revocation of the license, but do warrant corrective measures of less rigor.

The reports to this commission of the secretary, the general counsel, and the chief engineer are appended.

Respectfully submitted.

C. MCK. SALTZMAN. *Chairman.*

REPORT OF THE SECRETARY

JAMES W. BALDWIN

(Carl H. Butman served as secretary until May 1, 1930)

GENERAL

Consistent with the establishment of the commission as a permanent body there were created appropriate divisions and sections to which were allocated the administrative duties of the commission. New methods and policies were adopted to displace those employed during the temporary existence of the commission and with a view to possible future growth.

LICENSE DIVISION

This division was reorganized for the purpose of better administration.

There were received in this division 8,543 applications, as compared with 6,927 during the previous year; and there were issued 7,655 instruments of authority, as compared with 6,233 during last year.

Hearing notices, indicating the place and date of hearings, were mailed to 826 applicants.

To protect the rights of citizens of the United States in the use of frequencies assigned to them by the commission there were prepared separate lists, (a) fixed land and special, (b) aircraft, (c) portable, and (d) broadcasting, for registration at the International Bureau of the Telegraph Union at Berne, Switzerland; and weekly supplements thereto will follow as of course.

MAIL AND FILES

One of the newly created divisions is that of mail and files. This division has been assigned the responsibility of coordinating, consolidating, indexing, and classifying the files which have accumulated since the commission was created.

FINANCES

There was appropriated for the year ending June 30, 1930, \$295,440. This sum is accounted for as follows:

Appropriated -----	\$295,440
Expended:	
For personal services -----	255,674
For supplies and materials -----	3,475
For communication service -----	1,444
For travel expense -----	4,370
For printing and binding -----	22,524
For special and miscellaneous expenses -----	101
For equipment -----	7,796
Unobligated balance -----	3,456
Total -----	295,440

The general orders enacted and promulgated during the fiscal year related to a diversity of subjects. These orders and the subjects to which they relate may be briefly tabulated as follows:

70. Amending and enlarging provisions of General Order 51, which provided for the discontinuance of use of apparatus employing damped wave emissions.
71. Extending General Order 43, which provided for the limitation of chain broadcasting, to December 31, 1929.
72. Alaska licenses, etc., covering coastal and point-to-point transmitting stations extending to October 31, 1929.
73. Extending all licenses under General Order 72 to December 31, 1929. General Order 72 provided that Alaska licenses, etc., covering coastal and point-to-point transmitting stations be extended to October 31, 1929.
74. Amending General Order 55 affecting band of frequency between 1,500 and 6,000 kilocycles.
75. Violation of radio laws and regulations.
76. Amending General Order 24 to clarify amateur situation.
77. Installation of frequency control apparatus upon written authorization of commission.
78. Use of phonograph records and electrical transcriptions.
79. Rules and regulations governing issuance of construction permits, licenses, renewals of licenses and modifications of licenses, point-to-point or coastal service in Territory of Alaska.
80. Extending licenses of Alaska stations.
81. Rescinding General Orders 43 to 46 in reference to chain broadcasting.
82. Issuing of licenses to stations employing time wave emissions (conditions).
83. Alaskan licenses covering coastal and point-to-point transmitting stations. (See General Orders 72, 73, and 80.)
84. Rescinding General Orders 24 and 76, which refer to amateur stations, and adopting "Revised Amateur Regulations."
85. Amending General Order 74 to provide for emergency police radio service. General Order 74 affected band of frequency between 1,500 and 6,000 kilocycles.
86. Amending General Order 74, which affected band of frequency between 1,500 and 6,000 kilocycles, providing for emergency service for power companies.
87. Reallocation of frequencies in the case of certain clear channel stations for the purpose of reducing cross-talk interference.
88. Repeal of General Order 62 and the establishment of new channel separation in frequencies above 1,500 kilocycles.
89. Filing of applications.
90. Stations and operator's license to be posted.
91. Power and methods for determining operating power of broadcast transmitters.
92. Values of radio broadcasting stations fixed in units and quotas fixed.
93. Practice and procedure before the Federal Radio Commission.
94. Regulations governing aeronautical and aircraft stations.

The text of these general orders follows:

GENERAL ORDER No. 70

SEPTEMBER 13, 1929.

It is ordered that General Order No. 51 be amended and enlarged to include the following language:

"At all ship stations using damped waves, the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed two-tenths, except when sending distress signals or signals and messages relating thereto."

GENERAL ORDER No. 71

SEPTEMBER 18, 1929.

The commission hereby further postpones the effective date of General Order No. 43, limiting duplicated operation on cleared channels to stations more than 300 miles apart, 90 days, to December 31, 1929.

GENERAL ORDER No. 72

SEPTEMBER 26, 1929.

It is ordered: Pending the adoption by the commission of a policy with regard to stations in the Territory of Alaska, all existing licenses and/or special authorizations covering the operation of coastal and point-to-point transmitting stations located in said Territory, which, by their terms, expire September 30, 1929, are hereby extended for a period of 31 days, to expire October 31, 1929.

Provided, however, that this order shall not be deemed or construed as a finding or decision by the commission or as any evidence whatsoever that the continued use or operation of any such station after October 31, 1929, serves or will serve public interest, convenience, or necessity, or that public interest, convenience, or necessity would be served by the granting of any pending application for license or renewal of license, and the holder of any license or special authorization subject to this order who continues to use or operate any station during the period covered by this order shall be deemed to have consented to such condition.

GENERAL ORDER No. 73

OCTOBER 10, 1929

It is ordered that all existing licenses and/or special authorizations covering the operation of coastal and point-to-point transmitting stations located in the Territory of Alaska, heretofore extended by the commission's General Order No. 72, are hereby extended to and will expire December 31, 1929.

Provided, however, that this order shall not be deemed or construed as a finding or decision by the commission or as any evidence whatsoever that the continued use or operation of any such station after December 31, 1929, serves or will serve public interest, convenience, or necessity, or that public interest, convenience, or necessity would be served by the granting of any pending application for license or renewal of license, and the holder of any license or special authorization subject to this order who continues to use or operate any station during the period covered by this order shall be deemed to have consented to such condition.

GENERAL ORDER No. 74

OCTOBER 11, 1929.

General Order No. 55 is hereby amended to read as follows:

"The commission, in order to carry out the provisions of the radio act of 1927, having determined that public interest, convenience, or necessity requires the allocation of certain frequencies, within the band of frequencies between 1,500 and 6,000 kilocycles, to those services and classes of stations hereinafter enumerated, hereby enters the following order:

"It is ordered:

"PARAGRAPH I. That of those channels between 1,500 and 6,000 kilocycles, the following are hereby allocated to those services and classes of stations enumerated herein, for assignment to individual stations in conformity with this order. Each channel is specified by its center frequency.

"(a) Mobile services.

"1. Ship stations and/or coastal stations:

1,504,¹ 1,508,¹ 1,512,¹ 1,516, 1,520, 1,524, 1,528, 1,532, 1,536, 1,540,
1,548, 1,552, 1,556, 1,560, 1,568, 1,572, 1,576, 1,580, 1,588, 1,592,
1,660, 1,672, 1,684, 1,708, 2,320, 2,332, 2,350, 2,380, 2,428, 2,446,
2,518, 2,524, 2,530, 2,536, 2,542, 2,554, 2,560, 2,566, 2,578, 2,584,
2,590, 2,596, 2,668, 2,692, 2,728, 2,740, 3,112, 3,118, 3,124, 3,130,
3,420, 3,428, 3,436, 5,525 (calling only).

"2. Ship stations:

5,555, 5,615.

"3. Coastal stations:

4,116, 4,148, 4,172, 4,188, 4,196, 4,755, 4,775, 5,675.

¹To be reserved as interference guard band for broadcasting stations at all locations where the assignment to other services may result in interference with broadcasting stations.

- "4. Mobile press stations:
5,045, east of Mississippi River.
5,585, west of Mississippi River.
- "5. Reserved for temporary mobile assignments only:
1,544, 1,564, 1,584, 2,368, 2,392, 2,476.
- "6. Portable stations:
1,600, 1,652, 1,664, 1,680, 1,704.
- "7. Emergency police:
1,712, 2,416, 2,452.
- "8. Emergency fire (marine):
1,596.
- "9. Reserved for special mobile services other than portable:
2,410, 2,422, 2,440, 2,458, 2,470.
- "10. Aircraft and/or aeronautical stations:
1,608, 1,612, 1,616, 1,620, 1,624, 1,628, 1,632, 1,636, 1,640, 1,644, 1,648,
1,656, 1,668, 1,676, 1,688, 2,302, 2,326, 2,344, 2,362, 2,374, 2,482,
2,506, 2,608, 2,614, 2,620, 2,626, 2,632, 2,638, 2,644, 2,650, 2,662,
2,680, 2,698, 2,722, 2,734, 3,070, 3,076, 3,082, 3,088, 3,100, 3,136,
3,142, 3,148, 3,452, 3,460, 3,468, 3,484, 3,492, 4,108, 4,124, 4,140,
4,164, 4,180, 4,765, 4,785, 5,510, 5,540, 5,570, 5,600, 5,630, 5,660,
5,690.
- "11. Aircraft stations:
3,106, national calling frequency for all transport and itinerant air-
planes.
- "(b) Fixed services.
- "1. Point-to-point (shared between United States and Canada):
3,268, 3,274, 3,280, 3,286, 3,298, 3,304, 3,310, 3,316, 3,324, 3,332.
- "2. Point-to-point (United States exclusive):
4,268, 4,276, 4,284, 4,396, 4,405, 4,415, 4,535, 4,545, 4,555, 4,565, 4,575,
4,585, 4,595, 4,605, 4,615, 4,625, 4,635, 4,645, 4,655, 4,665, 4,675,
4,685, 4,695, 4,705, 4,715, 4,725, 4,735, 4,745, 4,925, 4,935, 4,945, 4,955,
4,965, 4,975, 4,985, 4,995, 5,005, 5,015, 5,025, 5,035, 5,045, 5,055, 5,065,
5,075, 5,085, 5,095, 5,105, 5,115, 5,125, 5,135, 5,145, 5,155, 5,165, 5,175,
5,185, 5,195, 5,205, 5,215, 5,225, 5,235, 5,245, 5,255, 5,265, 5,275, 5,285,
5,295, 5,305, 5,315, 5,325, 5,335, 5,345, 5,355, 5,855, 5,870, 5,885, 5,900,
5,975, 5,990.
- "3. General communication channels (other nations priority), provided that
such use will not cause interference to services in other North American
countries:
2,206, 2,212, 2,218, 2,224, 2,230, 2,236, 2,242, 2,248, 2,254, 2,260, 2,266,
2,272, 2,278, 2,284, 2,290, 2,296, 3,010, 3,016, 3,022, 3,028, 3,034, 3,040,
3,046, 3,052, 3,058, 3,196, 3,202, 3,208, 3,214, 3,220, 3,226, 4,004, 4,212,
4,220, 4,228, 4,324, 4,332, 4,340, 4,348, 4,356, 4,455, 4,465, 4,475, 4,485,
4,495, 4,505, 4,515, 4,805, 4,815, 4,825, 4,835, 4,845, 4,855, 4,865, 4,875,
4,885, 4,895, 4,905, 4,915, 5,375, 5,385, 5,395, 5,405, 5,415, 5,425, 5,435,
5,445, 5,455, 5,465, 5,475, 5,485, 5,495, 5,705, 5,720, 5,735, 5,750, 5,765,
5,780, 5,795, 5,810, 5,825, 5,840.
- "(c) Special services.
- "1. Amateur:
The band of frequencies between 1,715 and 2,000 kilocycles, inclu-
sive, and the band of frequencies between 3,504 and 4,000 kilo-
cycles, inclusive.
- "2. Experimental visual broadcasting:
The frequencies 2,000 to 2,200 kilocycles, inclusive, and 2,750 to
2,950 kilocycles, inclusive.
The frequencies 2,200 to 2,299 kilocycles, inclusive, provided that such
use will not interfere with radio services in other North American
countries.
- "3. General experimental:
1,604, 2,398, 4,795 (assigned to general experimental stations by all
North American nations).
3256 (shared between Canada and United States).
- "4. The following frequencies are to be assigned exclusively to stations de-
voted to promoting the interests of agriculture:
3,250 (shared between Canada and the United States).
4,244, 5,365 (United States exclusive channels).

"5. The following frequencies are reserved for assignment to stations rendering emergency services:

3,160, 3,166, 3,172, 3,178, 3,184 (shared between United States and Newfoundland).

3,238, 3,244 (shared between United States and Canada).

"6. In order to preserve a uniform channeling system, the commission urges upon Government services the desirability of operating upon the nearest standard channel, under the terms of General Order No. 62, to the frequency assigned it by the President, and for this purpose considers Government services to be operating upon the following frequencies:

1,692, 1,696, 1,700 (2,010 to 2,020 and 2,240 to 2,250 kilocycles shared with visual broadcasting), 2,308, 2,314, 2,338, 2,356, 2,386, 2,404, 2,434, 2,464, 2,488, 2,494, 2,500, 2,512, 2,548, 2,572, 2,602, 2,656, 2,674, 2,686, 2,704, 2,710, 2,716, 2,746, (2,885, 2,915 shared with visual broadcasting), 2,956, 2,962, 2,968, 2,974, 2,980, 2,986, 2,992, 2,998, 3,004, 3,034,² 3,064, 3,094, 3,154, 3,190, 3,232, 3,262, 3,292, 3,340, 3,348, 3,356, 3,364, 3,372, 3,380, 3,388, 3,396, 3,404, 3,412, 3,444, 3,476, 3,500 to 4,000, 4,012, 4,020, 4,028, 4,036, 4,044, 4,052, 4,060, 4,068, 4,076, 4,084, 4,092, 4,100, 4,132, 4,156, 4,204, 4,236, 4,252, 4,260, 4,292, 4,300, 4,308, 4,316, 4,364, 4,372, 4,380, 4,388, 4,425, 4,435, 4,445, 4,525, 5,915, 5,930, 5,945, 5,960.

"PAR. II. No license shall be granted to any applicant for a fixed station, coastal station, or aeronautical station who is unable to satisfy the commission that he can maintain the assigned station frequency with an accuracy of 0.05 per cent or better at all times.

"PAR. III. Licensees of fixed, coastal, or aeronautical stations shall obtain and use for tuning and checking the tuning of their transmitters suitable frequency-measuring equipment which shall be accurate within 0.025 per cent on the frequencies on which the transmitter is licensed to operate. The frequency-measuring equipment made available by the Department of Commerce shall be considered as standard for comparing and calibrating frequency-measuring equipment.

"PAR. IV. Licensees must use radio transmitters, the emissions of which, by reason of actual decrement, high-speed signaling modulation, spacing waves, harmonics, frequency modulation, key clicks, and mush, do not cause interference detrimental to traffic and programs being carried out on other authorized channels of communications."

GENERAL ORDER No. 75

OCTOBER 30, 1929.

1. Every licensee operating a radio station under a license from the Federal Radio Commission who receives a notification from a Department of Commerce supervisor or inspector regarding any violation of the Federal laws in force, or any violation of the orders or regulations of the Federal Radio Commission, or any violation of the terms and conditions of the station license shall within three days of receipt of such notice send a written reply in triplicate to the supervisor or inspector from whom the notification was received.

2. The answer to each notice shall be complete in itself and shall not be abbreviated in the least by reference to any other communications or answers to previous notifications that the licensee may have received and answered.

3. If the notification relates to some violation that may be due to the physical or electrical characteristics of the transmitting apparatus the answer to the inspector shall state fully what steps, if any, are being taken to prevent future violations; and if any new apparatus is to be installed the date such apparatus was ordered shall be given, the name of manufacturer, and promised date of delivery.

4. If the notification of violation relates to some violation caused by lack of attention or improper operation of transmitter, the name and license number of operator in charge shall be given.

* Shared between Canada and other nations. (See (b) 3, above.)

GENERAL ORDER No. 76

NOVEMBER 6, 1929.

It is ordered that General Order No. 24 be, and the same is hereby, amended to read as follows:

"For the purpose of clarifying the amateur situation the Federal Radio Commission has adopted the following definition and regulation:

"Any amateur station is a station operated by a person interested in radio technique solely with a personal aim and without pecuniary interest. Amateur licenses will not be issued to stations of other classes."

"In accordance with the channels designated for amateur use under the new International Radiotelegraph Convention, the Federal Radio Commission has opened for amateur use the new additional band between 30,000 and 28,000 kilocycles, or 9.99 and 10.71 meters. The radio division of the Department of Commerce is hereby authorized to open this band immediately for amateur use.

"Amateur radio telephone apparatus will be licensed for operation only in the following bands:

Kilocycles	Meters
60,000 to 56,000	5.00 to 5.36
14,300 to 14,100	84.50 to 85.70
3,550 to 3,500	150.00 to 175.00
2,000 to 1,715	

"Provided, however, that operation in the band of 14,300 to 14,100 kilocycles will be permitted only by operators holding extra first-class operator's licenses or, lacking such licenses, by operators who in their applications for station licenses show special technical qualification and ability to operate within the limits prescribed herein."

GENERAL ORDER No. 77

NOVEMBER 8, 1929.

It is ordered that in order to regulate the kind of apparatus to be used with respect to its external effects and to reduce interference between stations, any automatic frequency control apparatus, the purpose of which is to maintain the frequency of a radio transmitter upon the frequency assigned by the commission, or within the maximum tolerance therefrom allowed by the commission, shall be installed only upon receipt of, and in accordance with, written authorization from the commission.

Such authorization shall be applied for upon the form specifically provided by the commission for that purpose, and such form shall be executed and submitted in the same manner as other applications for authorizations from the commission.

GENERAL ORDER No. 78

DECEMBER 5, 1929.

It is ordered that General Order No. 52 be, and the same is hereby amended to read as follows:

"1. *Ordinary phonograph records, mechanical piano players, etc.*—All broadcasting stations shall announce clearly and distinctly the character of all mechanical reproductions broadcast by them. The announcement to immediately precede the broadcasting of each record. In such announcements each talking machine, phonograph, or graphophone record used, whatever its character, shall be described by the use of the exact words: 'This is a talking machine record,' or 'This is a phonograph record,' or 'This is a graphophone record'; each player-piano selection used shall be described as played by "mechanical piano player"; every other mechanical reproduction shall be similarly described by the term generally understood and used by the public and meaning such mechanical reproduction.

"2. *Exclusive transcriptions for broadcast purposes.*—Where a recording or transcript is made exclusively for broadcasting purposes and is neither offered nor intended to be offered for sale to the public, each such recording shall be immediately preceded and followed by the following statement: 'This program is an electrical transcription made exclusively for broadcast purposes.'

"Broadcasting stations shall not use such records, transcriptions, or piano-player rolls when the length of the rendition thereof exceeds 15 minutes unless provision is made for the announcement of the station call letters, which must be given, together with the statement above set forth, at least once every 15 minutes."

GENERAL ORDER No. 79

DECEMBER 20, 1929.

It is ordered that the following provisions be, and the same are hereby, adopted and promulgated as the rules and regulations of the Federal Radio Commission governing the issuance of construction permits, licenses, renewals of licenses, and modifications of licenses, with respect to stations engaged in or intending to be used in point-to-point or coastal service in the Territory of Alaska or its territorial waters.

1. The rules and regulations adopted by the commission on October 25, 1929, and recorded in the minutes of that date are hereby repealed.

2. Non-Government stations licensed pursuant to this general order shall provide adequate service at all times without discrimination for the general public.

3. Applications for construction permits or licenses for the construction or operation of non-Government stations shall be filed in triplicate in accordance with the radio act of 1927, upon forms furnished by the commission, with the supervisor of radio at Seattle, Wash., and shall be routed to the Federal Radio Commission as follows:

(a) Said supervisor shall send the applications to the "officer in charge, Washington-Alaska Military Cable and Telegraph System (W. A. M. C. A. T. S.). This officer shall recommend by indorsement the type of equipment, frequencies, etc., necessary for efficient operation with the Alaska system."

(b) Said officer shall then forward such applications to the office of the Chief Signal Officer of the United States Army. This officer will either approve or amend the recommendation of the officer in charge W. A. M. C. A. T. S.

(c) The Chief Signal Officer shall then send such applications to the chief of the radio division, Department of Commerce, who shall make the usual record in such cases and forward such applications to the Federal Radio Commission for final action.

4. Construction permits, licenses, and all formal notices shall be forwarded to the applicant or licensee in the reverse order of the procedure set out in section 3 hereof.

5. All licensees using transmitters employing damped-wave emissions shall change such equipment to transmitters employing continuous waves or modulated continuous waves at the earliest practicable date. In no case will the commission, after May 31, 1931, issue construction permits or licenses or renewal or modifications of licenses with respect to any transmitter employing damped-wave emissions.

6. (a) The following frequencies and types of emissions are hereby designated for point-to-point communication between Government and non-Government stations in Alaska, provided, however, that stations now equipped with damped-wave transmitters may continue the use of such transmitters only subject to the conditions of section 5 hereof:

172 kilocycles, A1, A2. ³	219 kilocycles, A1, A2. ³
178 kilocycles, A1, A2.	220 kilocycles, A1, A2. ³
182 kilocycles, A1, A2.	222 kilocycles, A1, A2. ³
183 kilocycles, A1, A2.	225 kilocycles, A1, A2. ³
186 kilocycles, A1, A2.	227 kilocycles, A1, A2. ³
187 kilocycles, A1, A2. ³	246 kilocycles, A1, A2.
188 kilocycles, A1, A2.	252 kilocycles, A1, A2.
189 kilocycles, A1, A2.	256 kilocycles, A1, A2.
192 kilocycles, A1, A2. ³	262 kilocycles, A1, A2.
193 kilocycles, A1, A2.	268 kilocycles, A1, A2.
212 kilocycles, A1, A2. ³	272 kilocycles, A1, A2. ³
217 kilocycles, A1, A2. ³	274 kilocycles, A1, A2.

³ Government frequencies.

and subject to the further provision that the commission will not approve the assignment of Government frequencies for the use of non-Government stations unless the Chief Signal Officer has approved the applications therefor.

(b) The following frequencies and types of emission are hereby designated for short-distance point-to-point communication between non-Government stations, provided that the maximum power on such frequencies shall not exceed 100 watts and upon the condition that no interference will result to other services.

3,160 kilocycles, A1, A2, A3.
 3,166 kilocycles, A1, A2, A3.
 3,172 kilocycles, A1, A2, A3.
 3,178 kilocycles, A1, A2, A3.
 3,184 kilocycles, A1, A2, A3.

(c) The following frequencies and types of emission are hereby designated for the use of stations engaged in ship-to-shore or coastal communications, provided the maximum power on such frequencies shall not exceed 200 watts:

1,540 kilocycles, A1, A2, A3.	500 A1, A2.	B Cailing and distress.
1,592 kilocycles, A1, A2, A3.	425 A1, A2.	B Working.
1,660 kilocycles, A1, A2, A3.	460 A1, A2.	Working.
1,708 kilocycles, A1, A2, A3.		
2,320 kilocycles, A1, A2, A3.		
2,428 kilocycles, A1, A2, A3.		
2,560 kilocycles, A1, A2, A3.		

and subject to the condition that after May 31, 1931, type B emissions shall not be employed.

GENERAL ORDER No. 80

DECEMBER 20, 1929.

It is ordered that all existing licenses and special authorizations covering the operation of coastal and point-to-point transmitting stations located in the Territory of Alaska, heretofore extended by the commission's General Orders No. 72 and No. 73, are hereby extended to and will expire March 31, 1930.

Provided, however, that this order shall not be deemed or construed as a finding or decision by the commission or as any evidence whatsoever that the continued use or operation of any such station after March 31, 1930, serves or will serve public interest, convenience, or necessity, or that public interest, convenience, or necessity will be served by the granting of any application for license or renewal of license, and the holder of any license or special authorization subject to this order who continues to use or operate any station during the period covered by this order shall be deemed to have consented to such conditions.

It is further ordered that no construction permit, license, or renewal or modification of license be granted unless subsequent to the issuance hereof an application therefor has been made pursuant to the radio act of 1927 and in accordance with the provisions of General Order No. 79 of the commission.

GENERAL ORDER No. 81

DECEMBER 20, 1929.

In order to assure the uninterrupted broadcasting of high-class chain programs for the benefit of the general public;

In order to afford adequate time to the Federal Radio Commission and full opportunity to investigate and determine whether chain programs are being unnecessarily duplicated, and to enable said commission to determine what progress has been and is being made toward the successful operation of two or more stations on the same frequency in synchronism, either by wire connection or otherwise;

To afford the Federal Radio Commission opportunity to determine whether chain broadcasting may be successfully carried on in the future with a more economic use of frequencies than now employed, it is

Ordered that General Order No. 43 of the Federal Radio Commission, adopted at a meeting of said commission on September 8, 1928, which had as its purpose the regulation of chain broadcasting and placed definite limitations on

stations which might engage in chain broadcasting, and General Order No. 46 of the Federal Radio Commission, adopted by said commission on October 5, 1928, as an amendment to General Order No. 43 aforesaid, be and said General Orders Nos. 43 and 46 of the Federal Radio Commission are hereby rescinded and repealed.

GENERAL ORDER No. 82

JANUARY 3, 1930.

It is ordered:

1. No license will be issued hereafter for the operation of any radio station using, or proposing to use, transmitting apparatus employing damped-wave emissions except under the following conditions:

(a) When such apparatus was installed on board a ship prior to January 1, 1930, in such cases licenses will be issued for the operation of damped-wave transmitters on the following frequencies only:

- 375 kilocycles.
- 410 kilocycles.
- 425 kilocycles.
- 454 kilocycles.
- 500 kilocycles.

(b) Licenses may be issued authorizing the operation of damped-wave transmitting apparatus in Alaska and its territorial waters provided such damped-wave transmitting apparatus was installed prior to January 1, 1930, and upon the condition that the operation of such damped-wave transmitting apparatus will cause no interference with any other radio service. In the issuing of licenses authorizing the use of damped wave transmitting apparatus for other than mobile stations the commission will in no case authorize the use of such apparatus subsequent to May 31, 1931, and in no case will the commission, after May 31, 1931, issue construction permits, licenses, or renewals, or modifications of licenses with respect to transmitting apparatus employing damped-wave emissions and located in the Territory of Alaska.

GENERAL ORDER No. 83

JANUARY 25, 1930.

It is ordered that all existing licenses and special authorizations covering the operation of coastal and point-to-point transmitting stations located in the Territory of Alaska, heretofore extended by the Federal Radio Commission's General Orders Nos. 72, 73, and 80, are hereby extended to, and will expire on, January 25, 1931.

Provided, however, that this order shall not be deemed or construed as a finding or decision by the commission or as any evidence whatsoever that the continued use or operation of any such station after January 25, 1931, serves or will serve public interest, convenience, or necessity, or that public interest, convenience, or necessity will be served by the granting of any application for license or renewal of license; and the holder of any license or special authorization subject to this order who continues to use or operate any station during the period covered by this order shall be deemed to have consented to such conditions.

It is further ordered that with regard to stations affected by this order no construction permit, license, or renewal or modification of license shall be granted unless, subsequent to the issuance hereof, an application therefor has been made pursuant to the radio act of 1927 and in accordance with the provisions of General Order No. 79 of the commission.

GENERAL ORDER No. 84

APRIL 4, 1930.

It is ordered:

1. That General Orders Nos. 24 and 76 be, and they are hereby, repealed.
2. That the revised regulations incorporated in the minutes of this date, entitled "Revised Amateur Regulations," are hereby adopted and shall be effective on and after April 5, 1930.

REVISED AMATEUR REGULATIONS

APRIL 4, 1930.

Under the provisions of section 4 of the radio act of 1927, as amended, the Federal Radio Commission establishes the following regulations for amateur radio stations:

SECTION 1. Definitions.—As used in these regulations:

(a) An amateur is a person interested in radio technique solely with a personal aim and without pecuniary interest.

(b) An amateur operator is a person holding a valid license from the Secretary of Commerce as a radio operator who is authorized under the regulations of the Secretary of Commerce to operate amateur radio stations.

(c) An amateur station is all the apparatus controlled from one location used for amateur radio communication.⁴

(d) Amateur radio communication is radio communication between amateur radio stations by telegraph, telephone, facsimile, or television solely with a personal aim and without pecuniary interest.

(e) A fixed station is a station permanently located.

(f) A mobile station is a station permanently located upon a mobile unit and ordinarily used while in motion.

(g) A portable station is a station so constructed that it may conveniently be moved about from place to place for communication and is in fact so moved about from time to time, but not ordinarily used while in motion.

SEC. 2. Classification of amateur stations.—The public interest, convenience, and necessity will be served by the operation of amateur stations. Save as restricted by and subject to the provisions of treaty, law, or regulations of the commission and with the exception of individual cases where the public interest, convenience, or necessity requires otherwise, all applications from amateurs for amateur-station licenses will be granted.

SEC. 3. Prescription of the nature of service to be rendered.—(a) For the present, amateur mobile stations will not be licensed.

(b) Amateur stations are to communicate only with similar stations. In emergencies or for testing purposes they may communicate with commercial or Government stations. They may also communicate with mobile craft and expeditions which do not have general public-service licenses and which may have difficulty in establishing communication with commercial or Government stations.

(c) Amateur stations shall not broadcast news, music, lectures, sermons, or any form of entertainment to the general public.

(d) Amateur stations shall not transmit or receive messages for hire nor engage in communication for material compensation, direct or indirect, paid or promised.

(e) Except as otherwise herein provided, amateur radio stations shall be used only for amateur radio communication, as defined in section 1, paragraph (d) above.

SEC. 4. Assignment of bands of frequencies.

(a) The following bands of frequencies are assigned exclusively to amateur stations:

1,715 to 2,000 kilocycles.	28,000 to 30,000 kilocycles.
3,500 to 4,000 kilocycles.	56,000 to 60,000 kilocycles.
7,000 to 7,300 kilocycles.	400,000 to 401,000 kilocycles.
14,000 to 14,400 kilocycles.	

(b) All bands of frequencies so assigned may be used for continuous wave telegraphy.

(c) The following bands of frequencies may also be used for radio telephony:

1,715 to 2,000 kilocycles.
3,500 to 3,550 kilocycles.
56,000 to 60,000 kilocycles.

(d) Upon application, amateurs who hold operators' licenses from the Secretary of Commerce of the extra first-class amateur grade, or higher, or who show special technical qualifications, satisfactory to the licensing authority, will also be licensed for radio telephony in the band of frequencies:

14,100 to 14,300 kilocycles.

⁴ As a matter of licensing procedure in all cases of remotely controlled transmitters, the location of the station shall be assumed to be that of the control point, save that, where such control point is more than 5 miles from the radiating antenna, the location shall be assumed to be that of the radiating antenna.

(e) The following bands of frequencies may also be used for television, facsimile, and picture transmission:

1,715 to 2,000 kilocycles.
56,000 to 60,000 kilocycles.

(f) Licenses to individual amateur stations shall permit the use of all frequencies within the service bands above assigned which the licensee may be entitled to use and shall not specify individual frequencies.

SEC. 5. *Location.*—An amateur radio station shall not be located upon premises controlled by an alien.

SEC. 6. *Regulations concerning the kind of apparatus to be used, with reference to its external effects.*—(a) Amateur stations shall not use apparatus transmitting damped waves.

(b) The frequency of the waves emitted by amateur stations must be as constant and as free from harmonics as the state of the art permits. For this purpose they must use circuits loosely coupled to the radiating system or devices that will produce equivalent effects to minimize keying impacts and harmonics. Conductive coupling to the radiating antenna, even though loose, is not permitted, but this restriction does not apply against the employment of transmission-line feeder systems to Hertzian antennas.

(c) Amateur stations must use adequately filtered direct-current power supply or arrangements that produce equivalent effects to minimize frequency modulation and prevent the emission of broad signals.⁵

(d) Amateur stations are authorized to use a maximum power input into the last stage of a transmitter of 1 kilowatt.

SEC. 7. *Regulations deemed necessary to prevent interference.*—(a) In the event that the operation of an amateur station causes general interference with broadcast reception in receiving apparatus of modern design, that amateur station shall not operate during the hours from 8 o'clock p. m. to 10.30 p. m., and on Sundays from 10.30 a. m. until 1 p. m., local time, upon such frequency or frequencies as cause such interference.

(b) An amateur station shall transmit its assigned call at the end of each transmission, but in any event at least once during each 15 minutes of operation.

SEC. 8. *Other regulations.*—(a) Amateur station licenses shall be issued only to persons who are amateurs, as defined in section 1, paragraph (a) above.

(b) Amateur station licenses shall be issued only to persons who are amateur operators, as defined in section 1, paragraph (b) above; provided, however, that if an applicant is not such an operator, an amateur station license shall be issued him upon the presentation of affirmative evidence that the station, when licensed, will be operated by an amateur operator.

(c) Amateur station licenses shall not be issued to corporations or associations; provided, however, that in the case of a bona fide amateur radio society, a license may be issued to an authorized official of such society as trustee therefor.

(d) The licensee of a portable station shall give advance notice to the supervisor of radio in the district where application was made for said portable station license, of all locations in which the station will be operated.

(e) The licensee of an amateur station shall keep an accurate log of station operation, in which shall be recorded the time of each transmission, the station called, the input power to the last stage of the transmitter, and the frequency band used.

SEC. 9. *Administration.*—For the purpose of administering these regulations and under the findings of public interest, convenience, and necessity herein made, all ministerial and routine duties in connection with the licensing of amateur radio stations will be performed by the radio division of the Department of Commerce. That division will issue, on behalf of and in the name of the commission, all licenses the applications for which disclose no question involving discretion and which require no determination of controverted questions of fact. All applications tendering such questions shall be referred by the radio division to the commission.

⁵ The use of unrectified alternating-current power supply will be considered satisfactory in the amplifier stages of oscillator-amplifier transmitter so arranged that variations in plate voltage can not affect the frequency of the oscillator.

GENERAL ORDER No. 85

APRIL 8, 1930.

It is ordered:

1. That General Order 74 be amended so as to provide for emergency police radio service as hereinafter set forth.

2. *Definition.*—Emergency police radio service is the broadcasting of emergency communications from central police headquarters to squad cars or other mobile units.

To whom licenses will be issued.—Licenses for emergency police radio service will be authorized only for municipally controlled stations.

Assignment of frequencies.—The following frequencies are designated for emergency police service:

1,712, 2,410, 2,416, 2,422, 2,440, 2,452, 2,458, and 2,470 kilocycles.

No specific frequency will be assigned for the exclusive use of any licensee.

One frequency may be shared by a number of municipalities in the same geographical area.

Prerequisites to authorization.—Construction permits and licenses will be granted on condition:

(1) That the station be operated only for the purpose of transmitting dispatches of an emergency nature to squad cars or other mobile units; provided, however, that the frequency may be used for the transmission of test messages not to exceed two minutes in each half-hour period; and further, that before testing, the station shall make certain that no interference will result to reception in other locations.

(2) That a survey has been completed to determine the most suitable location from which the lowest possible power with highest percentage of modulation will afford coverage over the desired service area; provided, however, that in no case will the commission authorize an amount of power in excess of that shown in the subjoined table of the following paragraph, or a modulating capacity of transmitter less than 85 per cent on peaks. Furthermore, no transmitter will be permitted to operate unless the applicant can show that the carrier frequency will be kept within 0.025 per cent of the assigned frequency by automatic frequency control.

Power.—The maximum amount of power to be assigned for the use of stations will be based on the latest Census Bureau population figures for cities or State subdivisions in accordance with the following table:

Population	Power (watts)	Population	Power (watts)
Under 100,000	50	400,000 to 500,000	250
100,000 to 200,000	100	500,000 to 600,000	300
200,000 to 300,000	150	600,000 to 700,000	400
300,000 to 400,000	200	Over 700,000	500

In the event that the amount of power allocated above is insufficient to afford reliable coverage over the desired service area, the commission will, upon proper showing being made, authorize the use of additional transmitters of duplicate power.

GENERAL ORDER No. 86

APRIL 8, 1930.

It is ordered:

1. That General Order 74 be amended in so far as it provides for emergency service for power companies.

2. (a) That emergency radio service for power companies is service providing for emergency radio communication between power company stations when all forms of wire communication fail.

(b) That the frequency 3,184 kilocycles with maximum power of 500 watts, type A-1 (CW) emission be authorized for use by power companies for the purpose of handling dispatches of an emergency nature during times when such traffic can not be otherwise delivered because of the breakdown of established means of communication.

(c) That the frequency may be used for testing purposes not to exceed 10 minutes per day, provided, however, that before testing, the station shall ascertain that the frequency is clear and that no interference will result to other stations or services.

3. That all licenses heretofore issued to power companies for emergency service be so modified as to conform with this general order.

GENERAL ORDER No. 87

APRIL 7, 1930.

It is ordered that, effective 3 a. m. Eastern Standard Time, April 30, 1930, General Order No. 40, dated August 30, 1928, be, and the same is hereby, amended to read as follows:

"The commission has determined that the definite assignment of a band of frequencies for broadcasting, the maintenance of a separation of 10 kilocycles between frequencies used in broadcasting, the reservation of certain frequencies for exclusive use by stations in the Dominion of Canada, and the setting aside of a certain number of other frequencies for shared use by the United States and the Dominion of Canada, all as hereinafter specified in this order, will serve public interest, convenience or necessity.

"The commission has further determined after careful consideration that the allocation of frequencies, of time for operation, and of station power, for use by broadcasting stations, to the respective zones, as herein below specified in this order:

"(a) Is necessary in order to comply in part with the requirements of section 9 of the radio act of 1927 as amended by section 5 of the act of Congress March 28, 1928, in so far as it requires that the licensing authority shall as nearly as possible make and maintain an equal allocation of bands of frequency or wave lengths, of periods of time for operation, and of station power, to each of the zones when and in so far as there are applications therefor, and

"(b) Will promote public interest and convenience and will serve public necessity, in so far as this can be done in a manner consistent with the requirements of said section 9 of the radio act of 1927 as amended by section 5 of the act of Congress, March 28, 1928, and will greatly improve reception conditions in the broadcast band, by the elimination of a large portion of the interference which now exists.

"It is therefore ordered:

"PARAGRAPH 1. That a band of frequencies extending from 550 to 1,500 kilocycles, both inclusive, be, and the same is hereby, assigned to and for the use of broadcasting stations, said band of frequencies being hereinafter referred to as the broadcast band. This order is not to be construed as prohibiting the licensing of maritime mobile services on the frequency of 1,365 kilocycles, as provided by the International Radio Telegraph Convention of 1927.

"PAR. 2. That within said broadcast band a separation of 10 kilocycles be maintained between the frequencies assigned for use by broadcasting stations.

"PAR. 3. That, of the frequencies within said broadcast band, (a) the frequencies of 690, 730, 840, 910, 960, and 1,030 kilocycles be, and the same are hereby, reserved for use by broadcasting stations located in the Dominion of Canada, and shall not be assigned to any broadcasting station licensed by this commission; (b) the frequencies of 580, 600, 630, 780, 880, 890, 930, 1,010, 1,120, 1,200, and 1,210 kilocycles be, and the same are hereby, set aside for simultaneous use by broadcasting stations located both in the Dominion of Canada and in the United States, its Territories and possessions, and no station will be authorized by this commission on any of these frequencies with an authorized power which will cause interference at the boundary line between the Dominion of Canada and the United States of America or in excess of 500 watts at any place within the United States of America or the Territories of Alaska and Porto Rico.

"PAR. 4. That the frequencies within said broadcast band (subject to the foregoing) and periods of time for operation and station power to be used by broadcasting stations on said frequencies be, and the same are hereby, allocated equally to the zones as follows:

"(a) The following frequencies are allocated to the first, second, third, fourth, and fifth zones, respectively, as below indicated for use by broadcasting sta-

tions, the amount of power to be used by such stations to be determined by further order of the commission:

First zone: 660, 710, 760, 860, 990, 1,060, 1,100, and 1,160 kilocycles.
 Second zone: 700, 750, 820, 980, 1,020, 1,080, 1,140, and 1,150 kilocycles.
 Third zone: 650, 740, 800, 850, 1040, 1,070, 1,130, and 1,190 kilocycles.
 Fourth zone: 670, 720, 770, 810, 870, 1,000, 1,110, and 1,180 kilocycles.
 Fifth zone: 640, 680, 790, 830, 970, 1,050, 1,090, and 1,170 kilocycles.

"(b) The following frequencies are allocated each for use by not less than two zones, with broadcasting stations in these zones being permitted to operate simultaneously, each station to have an authorized power not to exceed 5 kilowatts, the particular zone entitled to share in the allocation of any particular frequency to be determined by further order of the commission:

1,460, 1,470, 1,480, and 1,490 kilocycles.

"(c) The following frequencies are allocated for use by not less than two nor more than three zones, the broadcasting stations in those zones being permitted to operate simultaneously and to have an authorized power not to exceed 1,000 watts, the particular zones entitled to share in the allocation of any particular frequency to be determined by further order of the commission:

580, 590, 600, 610, 620, 630, 780, 880, 890, 900, 920, 930, 940, 950,
 1,010, 1,120, 1,220, 1,230, 1,240, 1,250, 1,260, 1,270, 1,280, 1,290, 1,300,
 1,320, 1,330, 1,340, 1,350, 1,360, 1,380, 1,390, 1,400, 1,410, and 1,430
 kilocycles.

"(Except that in those cases where the station locations and powers are such that interference will not be caused, four or five zones instead of three zones may share one or more of the foregoing frequencies where practicable.)

"(d) The following frequencies are allocated for use in all five zones with broadcasting stations permitted to operate simultaneously, each station to have an authorized power not to exceed 1,000 watts:

550, 560, 570, 1,440, and 1,450 kilocycles.

"(e) The following frequencies are allocated for use in all five zones by broadcasting stations in simultaneous operation with an authorized power not to exceed 100 watts, the number of such stations to be permitted to operate simultaneously in each zone on each of said frequencies to be determined by further order of the commission:

1,200, 1,210, 1,310, 1,370, 1,420, and 1,500 kilocycles.

"(f) Whenever the word 'frequency' is used in the preceding subparagraphs *a*, *b*, *c*, *d*, and *e* of this paragraph, it is to be understood as connecting periods of full-time operation—that is to say, 24 hours daily—and every allocation herein of a frequency to a particular zone is to be considered as carrying with it an assignment of full-time operation on that frequency to that zone.

"PAR. 5. That the allocation hereinbefore ordered in paragraph 4 of this order be, and the same is hereby declared to be, effective on April 30, 1930, at the hour of 3 o'clock a. m., eastern standard time; and that the provisions of paragraphs 1, 2, and 3 be, and the same are hereby declared to be, effective as of the date of the issuance of this order."

GENERAL ORDER No. 88

APRIL 14, 1930.

It is ordered that General Order No. 62 is hereby repealed.

That in the frequencies exceeding 1,500 kilocycles per second, a channel of radio communication shall be regarded as a band of frequencies, the width of which varies according to its position in the spectrum. The width of these channels increases with the frequency according to the following table:

Frequency (kilocycles)	Channel width (kilocycles)	Frequency (kilocycles)	Channel width (kilocycles)
1,500 to 2,198	4	8,210 to 10,980	20
2,200 to 3,313	6	10,990 to 16,405	30
3,316 to 4,400	8	16,420 to 21,960	40
4,405 to 5,490	10	21,980 to 32,780	60
5,495 to 8,202.5	15		

NOTE.—A visual broadcasting channel shall not be more than 100 kilocycles in width. A commercial telephone channel below 3,313 kilocycles shall be re-

garded as 6 kilocycles in width. A relay broadcasting channel between 6,000 and 9,600 kilocycles shall be regarded as 20 kilocycles in width.

In granting licenses, the Federal Radio Commission will specify the frequency in the center of the particular channel licensed to be used, but the licensee may occupy the center frequency and in addition such adjacent frequencies (within the limit indicated on the above table) as may be permitted by the frequency maintenance tolerance and required by the type of emission the station may be authorized to use, all of which will be specified in the instrument of authorization.

Licenses of fixed stations who have been granted the use of a channel for communications with specified points, upon application to the commission for licenses may be granted the use of the same channel for communications with other points on the condition that the public interest, convenience, and necessity will be served by such a grant.

From and after the adoption of this general order no licenses or renewals thereof for operation in the frequencies hereinabove named shall be granted for a longer period than December 31, 1930.

MAY 20, 1930.

Inclosed herewith is a copy of General Order No. 89, promulgated by the Federal Radio Commission and effective May 1, 1930.

Your attention is particularly directed to paragraph 2 of this general order and you are hereby advised that full compliance with these provisions will be insisted upon by the commission.

Proper application blanks may be secured from the supervisor of the district in which your station is located. The responsibility for obtaining the proper application blank and its accomplishment will rest entirely upon the applicant.

Existing regulations require that application must be forwarded through the office of the supervisor of the district in which your station is located.

GENERAL ORDER No. 89

APRIL 21, 1930.

It is ordered, effective May 1, 1930:

1. All applications for renewal of license must be filed so as to be received at the offices of the supervisor of radio in charge of the district in which the station is located at least 30 days prior to the expiration date of the license sought to be renewed.

2. That in no case where an applicant fails to meet the foregoing requirements shall any temporary extension of license be granted pending action of the commission upon the application for renewal of license. And in any case where the applicant has failed to meet the foregoing requirements, and no action is taken by the commission on the application for renewal of license before the expiration date of the license sought to be renewed, the licensee shall cease operating in accordance with the terms of said license.

GENERAL ORDER No. 90

MAY 19, 1930.

It is ordered that every station license shall be posted by the licensee in a conspicuous place in the room in which the transmitter is located, and the license of every station operator shall be posted in a conspicuous place in the room occupied by said station operator while on duty.

GENERAL ORDER No. 91

[Specifying and limiting the maximum rated power of broadcast transmitters which may be installed hereafter and specifying methods for determining the operating power of broadcast transmitters of various types]

MAY 23, 1930.

MAXIMUM ALLOWABLE RATED CARRIER POWER

It is ordered:

SECTION 1. That the maximum rated carrier power of all broadcast transmitters to be installed after this date shall be determined by the authorized

power as given in Table 1 of this section. The maximum carrier power rating shall be determined as provided in section 2 of this general order.

TABLE I

Authorized power (watts)	Maximum carrier power allowed to be installed (watts)
(a) 5 to 100 250 (day)	100 250
(b) 250 to 1,000 2,500 to 5,000	1,000 5,000
(c) The maximum power to be installed in stations with an authorized power of over 5,000 watts shall be the same as the authorized power.	

Applicants requesting power from 5 to 50 watts, or from 250 to 500 watts, inclusive, may be allowed to install transmitters of the same maximum carrier power as the authorized power.

Sec. 2. The maximum power of all broadcasting transmitters shall be determined by the installed vacuum tube capacity of the oscillator or radio frequency power amplifier which supplies power to the antenna.

Transmitters employing high-level modulation shall be rated as the same maximum carrier power as the total installed tube power capacity of the stage which supplies power to the antenna. The maximum carrier power of transmitters employing low-level modulation shall be rated as one-fourth the installed tube power capacity of the stage which supplies power to the antenna. (If this does not give an even number, the nearest even figure shall be used.)

The power capacity of all standard tubes commonly used in broadcasting transmitters with a power of 50 watts or above as oscillators, or class 3 or class C amplifiers, is fixed and approved as set out in Table II, hereafter set out in this section. Any tube of a power rating or type number not listed in Table II may be specified on an application to the commission, provided the manufacturer's maximum rating and operating constants as oscillator or class C amplifier are definitely shown in such application, subject to approval by the commission.

TABLE II

Power rating (watts)	De Forest	R. C. A. radiotron	Western Electric
50	503-A-511-545.....	UV203-A-UV-211-UV845.....	211-A to E, 242-A, 248-A.
75	552-560.....	UX852-UX860.....	
250	504-A.....	UV204-A.....	212-A to E, 241-A.
350	.....	UV849.....	
500	500-561.....	UV861.....	
1,000	.....	UV851-UV206.....	
2,000	.....	.....	243-A.
5,000	520-B.....	.....	228-A.
10,000	.....	UV207-UV848-UV863-UV854.....	220-B, 240-A.
15,000	.....	.....	236-A.
35,000	.....	.....	232-A.
100,000	.....	UV862.....	

Sec. 3. No licensee shall increase the number of vacuum tubes or change to vacuum tubes of higher rating in the oscillator or radio-frequency power amplifier which supplies power to the antenna, or change the system of modulation without the authority of the commission therefor.

DETERMINATION OF OPERATING POWER

Sec. 4. The operating carrier power of broadcasting transmitters shall be determined by the antenna input power either by (a) direct measurement or

(b) by indirect measurement by means of the plate input power of the oscillator or last stage radio power amplifier which supplies power to the antenna.

(a) The antenna input power by direct measurement is the square of the antenna current times the antenna resistance at the place where the current is measured and at the operating frequency. The direct measurement of the antenna input power will be accepted as operating power, provided the data on the antenna resistance measurements are submitted under oath, giving detailed description of the method used and data taken. The antenna current shall be measured by an ammeter of accepted accuracy and subject to such verification as the commission may determine.

Any licensee from whom the commission accepts antenna input power by direct measurement as the operating power, shall not make any changes in the antenna system without the authority of the commission.

(b) The antenna input power shall be determined by indirect measurement from the plate input power by multiplying plate voltage by the plate current of the oscillator or last stage radio power amplifier which supplies power to the antenna and by the proper percentage given in Table III or IV in accordance with the power and system of modulation used.

The operating power of transmitters employing high-level modulation shall be determined from the plate input in accordance with Table III.

TABLE III

Maximum carrier power of transmitter (watts)	The power output shall be considered to be this percentage of plate input
5 to 100	50
250 to 1,000	60
2,500 to 50,000	65

The operating power of transmitters employing low-level modulation in terms of plate input and maximum percentage of modulation of the antenna current without over 5 per cent second and third harmonics shall be determined in accordance with Table IV. No distinction will be recognized between transmitters of different power or between transmitters of greater maximum carrier power than the operating power.

TABLE IV

Maximum percentage of modulation	The exact output shall be this per cent of the plate input
100 to 80	33 $\frac{1}{4}$
75 to 50	40

SEC. 5. Operating power rating based on field intensity measurements may be accepted in lieu of antenna input power, provided a sufficient number of measurements are taken to insure accuracy and a theoretical analysis of the antenna is submitted, indicating horizontal and vertical distribution of the radiation. This data must be submitted to the commission for such verification as it may consider necessary. Any licensee from whom the commission accepts operating power based on field intensity measurements shall not make any changes in the antenna system without the authority of the commission therefor.

SEC. 6. All transmitters shall be equipped with indicating instruments of accepted accuracy which will give the values of the antenna current, voltage supplied to the plate circuit of the oscillator or power amplifier stage which supplies power to the antenna, and the total direct current flowing in the plate circuit of the oscillator or power amplifier stage which supplies power to the antenna.

GENERAL ORDER No. 92

JUNE 17, 1930.

Whereas the act of Congress approved March 28, 1928, entitled "An act continuing for one year the powers and authority of the Federal Radio Commission under the radio act of 1927, and for other purposes," provides and declares that "The people of all the zones established by section 2 of this act (radio act of 1927) are entitled to equality of radio broadcasting service, both of transmission and of reception"; and

Whereas said act approved March 28, 1928, above referred to, also provides and requires that "in order to provide said equality the licensing authority shall as nearly as possible make and maintain an equal allocation of broadcasting licenses, of bands of frequency or wave lengths, of periods of time for operation, and of station power"; and

Whereas it was the intent and purpose of Congress to secure an equal distribution of radio broadcasting service, both of transmission and of reception between the five zones aforesaid; and

Whereas it is necessary, in order to make and maintain such equal allocation between said five zones and fairly and equitably between the States within each of the zones, that the commission determine the value of stations of various classes or of various powers in effecting such allocation; and

Whereas the commission has sought and obtained the best advice and information available and has given much time to an intensive study to such values of stations of various powers; and

Whereas the commission, through its engineers and from studies made by the commission, has considered all the elements required by Congress to be considered, and has allowed the paramount intent and purpose of the act of March 28, 1928, above referred to, to control, i. e., "that the people of all the zones * * * are entitled to equality of radio broadcasting service, both of transmission and of reception"; and

Whereas it has been found that, according to the broadcasting service rendered to the people of each zone and of the States within each zone by stations of various classes, both of transmission and of reception, each class of station is of the following value in units, to wit:

Classes of stations

(A) FOR FULL-TIME STATIONS

	Value in units
(1) Stations of a power of 5 kilowatts or more, 1 station only operating on the channel at night-----	5
(2) Stations of a power of 5 kilowatts or more, 2 stations operating simultaneously on a common frequency and separated by 2,000 miles or more-----	4
(3) Stations of a power of 5 kilowatts or more, 2 or more stations operating on a common frequency and stations separated by less than 2,000 miles-----	2
(4) Stations of a power of 1 kilowatt, 2 or more stations operating simultaneously on a common frequency-----	1
(5) Stations with 500-watt power with more than 2 stations operating simultaneously on a common frequency-----	.6
(6) Stations with 250-watt power with more than 2 stations operating simultaneously on a common frequency-----	.4
(7) Stations with 100-watt power or less with 2 or more stations per zone operating simultaneously on a common frequency-----	.2

(B) DAY STATIONS

(1) Stations of a power of 5 kilowatts operating during daylight hours only simultaneously with stations of class A (1), above-----	1.5
(2) Stations of a power of 2.5 kilowatts operating during daylight hours only-----	.75
(3) Stations of a power of 1 kilowatt operating during daylight hours only-----	.5
(4) 500, 250, or 100 watt stations operating during daylight hours only, one-half values given for corresponding full-time stations above.	

(C) FULL-TIME STATIONS HAVING EXCESS DAY POWER

All stations shall have their values in units based on one-half the units for full-time stations of same power as the stations have at night plus the value in units for a day station of the same power as the station has in daytime, as follows:

1 kilowatt night, 2½ kilowatts day, equal.....	1.25
500 watts night, 1 kilowatt day, equal.....	.8
250 watts night, 500 watts day, equal.....	.5
100 watts night, 250 watts day, equal.....	.3

(D) LIMITED-TIME STATIONS

For stations of more than 5 kilowatts the value of units will be the same for all powers. The units will be based on 5 units. The units for each station will therefore be 2.5 for day operation plus 2.5 times hours used between 6 p. m. and 12 p. m., local time, divided by 12.

Stations over 5 kilowatts operating—

1 night hour.....	2.7
2 night hours.....	2.9
3 night hours.....	3.1

For stations of 5 kilowatts the basis shall be 1.5 units for day operation, the same as a 5-kilowatt day station given above, plus 2.5 units times hours used between 6 p. m. and 12 p. m., local time, divided by 12.

Station of 5 kilowatts operating—

1 night hours.....	1.7
2 night hours.....	1.9
3 night hours.....	2.1

For stations operating with power of 1 kilowatt, 500 and 250 watts, the value in units shall be the same as for a day station plus the value in units of day station times number of night hours used between 6 p. m. and 12 p. m., local time, dividing by 12.

1,000-watt stations operating—

1 night hour.....	.54
2 night hours.....	.58
3 night hours.....	.62

500-watt stations operating—

1 night hour.....	.32
2 night hours.....	.35
3 night hours.....	.38

250-watt stations operating—

1 night hour.....	.22
2 night hours.....	.23
3 night hours.....	.25

For stations dividing time on the same frequency the value assigned will be in proportion to the time assigned.

It is, therefore, ordered that the values of radiobroadcasting stations of the various classes, powers, and time of operation be, and they are hereby, fixed in units as above set forth; and

It is further ordered that each of the five zones created by section 2 of the radio act of 1927 shall each have broadcasting stations the total value in units of which shall be equal and shall be fairly and equitably distributed among and allocated to the States within each of said zones in proportion to the population each of said States bears to the population of the zone, and that the quota of broadcasting facilities to which each State is entitled shall be determined and fixed as herein provided and in accordance with values in units for various classes of stations above set out.

GENERAL ORDER No. 93

JUNE 25, 1930.

It is ordered that the following rules and regulations pertaining to practice and procedure before the commission be, and the same are hereby, adopted.

It is further ordered that all general orders or parts thereof and all rules and regulations in conflict therewith be, and the same are hereby, repealed.

It is further ordered that this general order be effective on September 1, 1930.

PRACTICE AND PROCEDURE BEFORE THE FEDERAL RADIO COMMISSION

SUBTITLE A.—GENERAL

SECTION 1. Office of the commission.—The principal office of the commission shall be located at Washington, D. C. Except for Sundays and legal holidays throughout the year and except for Saturdays after 1 o'clock p. m. during the period from June 1 to October 1 (both inclusive), the office will be open every day from 9 a. m. to 4.30 p. m.

SEC. 2. Meetings of the commission.—All meetings of the commission, unless otherwise determined by a majority of its members, shall be held at the principal office of the commission. The commission will, however, meet at another place if so determined by a majority of its members and may, by one or more of its members, or by such examiner or other employee as it may designate, hold hearings, conduct investigations, and prosecute any inquiry necessary to its duties at any other place.

SEC. 3. Secretary to sign instruments of authorization and orders.—All instruments of authorization granted by the commission and all orders issued by it shall, unless otherwise specifically provided by order of the commission, be signed by the secretary in the name of the commission.

SEC. 4. Official record.—The official record of any action of the commission, other than in connection with or as the result of hearings on applications or revocation proceedings, shall be the minutes of such session, kept by and in the custody of the secretary. The official record of any action by the commission made in connection with or as the result of any such a hearing, shall be the order of the commission entered and filed in the appropriate hearing docket file. Such official records shall be subject to inspection at the office of the secretary during business hours.

SEC. 5. Files.—The files of the commission shall not be open to inspection by the public except as follows:

- (a) Hearing docket files shall be open to inspection by anyone.
- (b) Copies of current permits, licenses, and other instruments of authorization shall be open to inspection by anyone having a legitimate interest therein.
- (c) Applications shall be open to inspection by the applicant himself or by any parties interested in the granting or denial of said applications.

SEC. 6. Seal.—The seal of the commission shall be affixed to all permits, licenses, and other instruments of authorization granted, and all orders issued by the commission.

SEC. 7. Certified copies.—A copy of any instrument or authorization granted by the commission, or of an order issued by the commission, or of any public record of the commission, will be certified to by the secretary of the commission under its seal. Any cost that may be necessary in preparing such copy shall be prepaid by the person requesting it.

SEC. 8. Official reporter.—The commission will designate from time to time an official reporter for the taking down and transcribing of its proceedings. No transcript of the testimony taken or argument had at any hearing held by the commission will be furnished to any party or to any other person by the commission; such transcript must be obtained directly from the official reporter.

SEC. 9. Copies.—Where, under these regulations, any document is permitted or required to be filed in connection with any hearing, it shall be necessary to file the same in duplicate unless otherwise expressly provided.

SEC. 10. Additional time to parties in certain cases.—Where, under these regulations, any limitation is made as to the time within which any document is required to be filed, or any other procedural step is required to be taken in connection with any hearing, parties who are residents of the fifth zone shall have an additional period of five days and parties who reside beyond the confines of the continental United States shall have an additional period of 20 days within which to file such document or take such other procedural step.

SEC. 11. Attorneys.—Any party to a proceeding before the commission may appear and be heard in person, by agent with power of attorney, or by attorney at law. All attorneys at law appearing must conform to the standard of ethical conduct required of practitioners before the courts of the United States.

SUBTITLE B.—ACTION ON APPLICATIONS

SECTION 1. Applications returned without action.—Any application which is not filed in accordance with the commission's regulations or, if properly filed,

does not comply with the regulations with respect to the form used, manner of execution, completeness of answer to questions, or any other information required will not be entered on the records of the commission or considered by the commission. Each such application shall be returned to the applicant by the secretary of the commission together with a brief statement of the respect in which the application is defective.

SEC. 2. Refiling of applications.—Upon the return of any such defective application, as provided in section 1, the applicant may either (a) correct the defective application and refile the same, or (b) if it is nevertheless believed to be sufficient, he may refile it without correction.

SEC. 3. Applications denied without hearing.—In the event that any defective application returned to the applicant is refiled without correction, as provided for in subdivision (b) of section 2, or where it appears from the face of any application or from any documents accompanying it that the instrument of authorization in question is one which may not be granted by the commission, or that the applicant is not eligible to receive such instrument under the laws or treaties of the United States, or under the terms of these regulations, the commission may deny such application without hearing and the secretary shall promptly mail a written notice of such denial to the applicant setting forth a brief statement of the reasons for such action.

SEC. 4. Hearings granted where interpretation of law, treaty, or regulation involved.—In any case enumerated in section 3, where the proper interpretation or application of the laws or treaties of the United States, or the proper interpretation or application, or the validity of the regulations of the commission is involved, the applicant may, by written request filed with the secretary, not later than 15 days from the date of mailing of the notice of denial by the secretary, have his application entered on the hearing docket and obtain a hearing with respect to such question or questions. The applicant shall in such written request specify the respects in which it is believed that the law or treaties or regulations have been wrongly interpreted or applied, or that the regulation is invalid, and the hearing will be limited to the issues thus presented. The time and place of hearing shall be fixed in the same manner as other applications designated for hearing and, pending such hearing, the effective date of the commission's denial shall be postponed to the date of the commission's decision after hearing. The commission may, after hearing or default, again deny the application or may, after hearing, set aside its previous denial thereof and proceed to consider the application on its merits in the same manner as other applications.

SEC. 5. Applications granted without hearing.—The commission will grant an application in whole or in part without hearing on the merits if it does not fall within any of the cases covered by sections 1 and 3 of this subtitle, or if it has been determined to be proper after a hearing pursuant to section 4 and in addition thereto it appears conclusively to the commission from the face of such application, from documents submitted therewith and from such other information as the commission may have—

(a) That the granting of such application either in whole or in part would serve public interest, convenience, and necessity, and

(b) That the granting of such application either in whole or in part would not aggrieve or adversely affect the interest of any person, firm, company, or corporation holding a permit, license, or other instrument of authorization from the commission, or having an application therefor pending before the commission.

In any case where the application is for a license or for a modification of license, pursuant to a construction permit previously granted by the commission, such license or modification of license will be granted without hearing if it appears conclusively to the commission that all the terms, conditions, and obligations set forth in the application for construction permit and in the permit have been fully met and that no causes or circumstances have arisen since the granting of such permit which would make the granting of said license or modification of license against public interest.

SEC. 6. Hearings in cases where applications are granted in part.—Where any application is granted by the commission in part or with any privileges, terms, or conditions other than those requested pursuant to section 5 and without a hearing thereon, the action of the commission shall be considered as the granting of such application unless the applicant shall, within 15 days of the date of mailing by the secretary of his written notice of such action, file with the commission a written request for a hearing with respect to the part or with

respect to the privileges, terms, or conditions not granted. The request for hearing shall be accompanied by a statement in writing of the facts which the applicant expects to prove upon such hearing. Upon the receipt of such request and statement in proper form, the application will be set for hearing in the same manner as other applications are set for hearing and the applicant and other parties in interest notified thereof. Within a period of 10 days from the receipt of such notice of hearing the applicant shall deliver or mail a copy of the statement of facts to be proved by it to all other parties notified of the hearing and shall file with the commission an affidavit stating that this requirement has been met. The evidence to be offered by any applicant upon such hearing shall be limited to the matter contained in the applicant's written statement of facts to be proved by it. Pending such hearing the effective date of the commission's action with respect to such application shall be postponed to the date of the commission's decision after hearing.

Sec. 7. All other applications designated for hearing.—In cases where the application is or has, pursuant to section 4 hereof, been determined to be proper upon its face but the commission is unable to determine without a hearing on the merits—

(a) That the granting of such application either in whole or in part would serve public interest, convenience, or necessity.

(b) That the granting of such application either in whole or in part would not aggrieve or adversely affect the interest of any person, firm, company, or corporation holding a permit, license, or other instrument of authorization from the commission, or having an application therefor pending before the commission—

the commission will designate the same for hearing and the following procedure will govern:

(1) The secretary shall forthwith mail a written notice to the applicant setting forth the action of the commission (together with such statement of the commission's reasons therefor as shall be appropriate to the nature of the application), the time and place for hearing and a list of the other parties notified thereof.

(2) In order to avail himself of the opportunity to be heard, the applicant shall, within 20 days of the mailing of the notice by the secretary, file with the commission a written appearance consisting of a statement of his desire to be heard, together with a statement in writing of the facts which he expects to prove at such hearing and an affidavit showing that a copy of such written statement has been served upon or mailed to all other parties notified of the hearing.

(3) In case no appearance or statement in writing of the facts to be proved upon such hearing is filed by the applicant within the time so specified (or any extension thereof as the commission may grant upon proper showing), the applicant will be defaulted and the application denied without a hearing and the secretary shall so notify the other parties to the hearing.

(4) In case the appearance and statement in writing of the facts to be proved is duly and seasonably filed, the application will be entered upon the hearing docket.

(5) If at the date set for hearing, either originally or as a result of continuances, the applicant does not appear, a default will be entered and the commission will deny the application.

(6) After a hearing has been held in accordance with the foregoing, the commission may grant the application, deny it, or grant it in part, or deny it in part.

(7) A partial denial of any application after hearing thereon shall be considered as a denial of the application.

Sec. 8. Repetition of applications.—Where an applicant has more than one application pending for essentially the same instrument of authorization, with respect to the character of station, type of service, and the territory sought to be served, the commission shall determine which of such applications shall be first considered by it. Where an applicant has been afforded an opportunity to be heard with respect to a particular application and the commission has, after hearing or default, denied the application, the commission will not consider or designate for hearing another application by the same applicant, or for his successor or assignee, until after the lapse of periods of time as follows:

(a) Where the second application is for exactly or substantially the same instrument of authorization with respect to the privileges, terms, and conditions

requested, and the territory sought to be served, a period of 12 months must elapse from and after the date of the commission's denial of the first application.

(b) Where the second application is for the same kind of instrument of authorization, with respect to type of service and the territory sought to be served, a period of six months must elapse from and after the date of the commission's denial of the first application.

Provided, however, that the foregoing provisions shall have no application where, since the commission's denial of the first application, there has been a material change in the facilities available for designation to the particular service sought to be established in the territory sought to be served.

SEC. 9. Applications pending appeal from decisions of the commission.—Where an appeal has been taken from the action of the commission in denying a particular application, the commission will not consider or designate for hearing another application for the same kind of instrument of authorization, with respect to the type of service and territory sought to be served, filed by the same applicant, his successor or assignee, until the final disposition of such appeal, provided, however, that where, pursuant to section 7 of subtitle B, an application is granted in part and denied in part and the applicant desires to utilize the partial grant and to contest the partial denial, any such applicant shall be permitted during the pendency of such appeal, and without prejudice thereto, to file such application or applications as shall be necessary or requisite to the utilization, extension, or renewal, but not for a modification of the instrument in the particulars theretofore denied, and the commission will consider and dispose of these applications.

SEC. 10. Application involving conflicting claims, etc.—In fixing dates for hearings the Secretary will, so far as possible, endeavor to fix the same date for hearings on all related matters which involve the same applicant and for hearings on all applications which by reason of the privileges, terms, or conditions requested present conflicting claims.

SEC. 11. Depositions.—In exceptional cases the commission may, either on its own motion or on written request by a party setting forth the facts which he expects to prove and the causes or reasons for the taking thereof, issue an order directing the time, place, and manner in which the testimony of a witness shall be taken by deposition. Such order shall be served upon all parties to the proceeding in which the deposition is to be used, and such deposition, when not otherwise directed, shall be taken, transcribed, and executed in the usual manner before any officer having power to administer oaths. The time within which any such deposition shall be filed with the commission shall be fixed in the order directing the taking thereof.

SEC. 12. Witnesses and subpoenas.—Subpoenas may be issued by the commission or any member thereof or by an examiner appointed by the commission to compel the attendance of any witness at any hearing or at the taking of any deposition, or to compel the production of any document. Service of any such subpoena may be made by any United States marshal or by his deputy or by any citizen of the United States competent to be a witness. If service is made by a United States marshal or by his deputy, his service shall be evidenced by his return thereon; if made by any other person by his affidavit stating the manner in which service was made, which affidavit shall be attached to and returned with the original subpoena. Witnesses who attend any hearing or the taking of any deposition in answer to a subpoena are entitled to and shall receive the same fees and mileage as are paid for like services in the courts of the United States, such sum to be paid by the party at whose instance the testimony is taken.

SEC. 13. Opening and closing.—In each formal hearing held on an application for an instrument of authorization, the applicant shall have the opening and closing of the evidence and argument, if any. In each formal hearing held on an order of revocation the commission shall have the opening and closing. In cases where the foregoing rules are inapplicable under the issues to be presented, the commission or the person conducting the hearing may fix the order of procedure.

SEC. 14. Amendments.—Where no prejudice results to other parties, a party will be permitted to amend his application, answer, or other pleading at any time prior to the conclusion of hearing provided, however, that no amendment of an application for an instrument of authorization as to the frequency, power, hours of operation, equipment, location of station, or points of communication in case of stations (other than broadcasting) will be permitted unless such

amendment is filed with the commission not later than 20 days before the hearing date. In all cases where an amendment is made to any application contrary to the foregoing provisions, such amendment shall have the effect of setting aside the assignment for hearing and any such application so amended shall be treated in all respects as an application originally filed. In any case where an application is amended in the particulars above enumerated the secretary shall notify all parties affected thereby.

SUBTITLE C.—REVOCATION PROCEEDINGS

SECTION 1.—Revocation proceedings and the conduct thereof.—Revocation proceedings under section 14 of the radio act shall be governed by the following procedure:

(a) Such proceedings shall in all cases be initiated by an order of revocation served upon or mailed by the commission to the holder of the license in question directing him to appear upon a date certain not less than 30 days after receipt of such notice and show cause why such order of revocation should not be made effective. This order of revocation shall be accompanied by a written statement of the cause for such proposed revocation.

(b) Either the respondent or any person in interest who would be aggrieved by any such revocation will be accorded an opportunity to appear and be heard in opposition to such order if, prior to the hearing date therein fixed, such respondent or other person shall deliver to the commission a written application therefor.

(c) Upon the filing of any such application the order of revocation shall stand suspended until the conclusion of the hearing herein provided for and the decision of the commission thereon; and the commission will forthwith fix the date for hearing and shall immediately mail a written notice of the time and place for such hearing to respondent and to all parties known to be interested in such license. The date fixed for hearing shall not be earlier than 30 days from the mailing of the notice thereof as herein provided.

(d) Not later than 20 days after date of mailing of the notices of hearing respondent shall file with the commission an answer executed and sworn to by a person having knowledge of the facts, in which answer the allegations of the statement of cause for revocation shall be specifically and in detail denied or explained as the case may be. Any person other than the respondent may likewise file an answer within the same time and upon the same terms and conditions. Evidence to be introduced upon such hearing will be limited to the issues formed by the commission's statement of cause for revocation and the answers filed thereto, and in case no such answer is filed within the period herein fixed or such extension thereof as the commission may allow, an order of default will be entered, no hearing will be held, and an absolute order of revocation will be issued forthwith.

(e) After hearing has been held in accordance with the foregoing, the commission may affirm or revoke such order of revocation.

SUBTITLE D.—FORMAL HEARINGS AND THE CONDUCT THEREOF

SECTION 1. Parties to hearings.—All persons who are permitted to be heard in support of any application made by them shall be referred to as "applicants." All persons who are permitted to be heard in opposition to any application or licenses against whom revocation proceedings are instituted shall be referred to as "respondents." All persons, firms, companies, or corporations holding permits, licenses, or other instruments of authorization from the commission, or who have applications pending before the commission who would be aggrieved, or whose interests would be adversely affected by the granting of any application designated for hearing, shall constitute proper parties respondent and shall be notified of any such hearing.

SEC. 2. Commission a party.—The commission, represented by its general counsel or such assistants as he may designate, shall be a party to every formal hearing to the extent that in its judgment such participation is necessary to carry out the intent of the laws and treaties of the United States and of these regulations.

SEC. 3. Intervention.—Any governmental department or officer, any person, firm, company, or corporation, or any State or political subdivision thereof may, at any time, more than 10 days prior to the date of any hearing, file with the commission a petition to intervene therein in support of or in opposition to any

application designated for hearing. If the petition discloses a substantial interest in the subject matter of the hearing, the commission will grant the same and permit the petitioner to be heard at such hearing subject to regulations hereinafter imposed.

Sec. 4. Taking of testimony and argument.—In case of any formal hearing herein provided for the testimony may be taken before a quorum of the commission, before less than a quorum of the commission, or before any examiner appointed by the commission in the discretion of the commission, as follows:

(a) In the event that the testimony is taken before the commission it may be followed by oral argument by the parties or by the filing of briefs, or both, at the discretion of the commission, and the case shall thereafter be decided by the commission on the basis of the testimony heard and the proceedings had.

(b) In the event that the testimony is taken before less than a quorum of the commission or before an examiner, the testimony, duly transcribed, shall be reported back to the commission by the person or persons conducting such hearing, together with a written report containing recommendations as to the decision to be made thereon, and the facts and grounds upon which such recommendation is based. A copy of such report shall be mailed by the commission to each party participating in the hearing, and such party or parties shall have the right, providing the same is exercised within a period of 15 days from the mailing of such report, to file exceptions to said report. Such exceptions shall point out with particularity the alleged error in said report and shall contain specific reference to the page or pages of the transcript of hearing or report referred to. In case any party filing an exception to a report desires oral argument thereon, he shall accompany the exceptions with a written request for such argument before a quorum of the commission and shall file therewith an affidavit stating that a copy of such exceptions and request for oral argument has been mailed to or served upon every other party participating in the hearing. Upon receipt of such request and affidavit, the commission may in its discretion fix a time for such oral argument to be held at its office in Washington, D. C., and give adequate notice to all parties participating in the hearing or it may consider and decide such matter without argument.

Sec. 5. Continuances.—Continuances of date of hearing, extensions of time for filing documents required to be filed, or for the taking of any other step in connection with any hearing, may be granted for reasons such as are usually considered sufficient for analogous continuances and extensions in the courts of the United States, providing, however, that request for such shall be made in writing setting forth the reasons therefor, and the additional time required, and provided, further, that such requests shall be made at a time and in such manner as to avoid unnecessary hardship or expense to other parties to the proceeding.

Sec. 6. Briefs.—Whenever consent is given to the filing of any briefs in connection with any hearing, 10 copies shall be filed with the commission within 20 days from the date on which hearing of testimony is concluded unless upon an affirmative showing the commission fixes a longer period. Each other party shall have 10 days from the filing of such brief within which to file an answer brief to any brief filed by such party. At or prior to the date fixed for filing any brief, the party filing the same shall serve or mail at least one copy thereof to every other party to the proceeding and no briefs will be accepted or considered by the commission unless accompanied by an affidavit to the effect that this requirement has been met.

Sec. 7. Documents to be typewritten or printed.—All pleadings, briefs, or other documents filed in connection with any hearing shall be printed or typewritten with such type and on such quality of paper as shall be easily legible. The commission reserves the right to refuse to receive or consider any document that does not meet this requirement.

Sec. 8. Evidence.—Except as hereinafter stated, the rules of evidence governing civil proceedings in the courts of the United States shall govern formal hearings before the commission, any commissioner or examiner, provided, however, that the commission reserves the right to relax such rules in any case where in its judgment the ends of justice will be better served by so doing.

(a) In any hearing on an application for an instrument of authorization the following records of the commission shall be considered as a part of the record

without special request or offer by any party unless otherwise stated in the transcript:

(1) A list of all stations, together with their authorized power, frequency, and hours of operation, licensed in the band of frequencies⁴ in which authorization to operate is sought;

(2) A list of all applications pending at the date of said hearing with respect to any station seeking to operate in said band;⁴

(3) Such of the commission's published rules, regulations, and general orders as have to do with the band of frequencies in question and with the services permitted in such band.⁴

(b) Copies of reports of any governmental department or agency made by an employee thereof in the course of his duties in so far as they are material shall be admissible in evidence without further authentication than a statement from the proper custodian of any such record or from the person compiling the same that the copy in question is a true copy of such record and that the record is what it purports to be.

(c) Where relevant and material matter offered in evidence is embraced in a document containing other matter not material or relevant and not intended to be put in evidence, such document will not be received, but the party offering the same shall present to opposing counsel and to the commission the original document together with true copies of such material and relevant matter taken therefrom as it is desired to introduce. Upon presentation of such matter in proper form it may be received in evidence and become a part of the record, provided, however, that opposing counsel shall be afforded an opportunity to introduce in evidence, in like manner, other portions of such document if found to be material and relevant.

(d) Except as herein otherwise expressly provided, no document or exhibit or a part thereof shall be received as or admitted in evidence unless the offer in evidence is accompanied by a tender of the original and a full, true, and correct copy or a full, true, and correct copy of such document or exhibit in duplicate.

(e) Except as herein expressly stated, unsworn documents and oral declarations will not be received in evidence.

(f) The introduction of merely cumulative evidence shall be avoided and the commission reserves the right to limit the number of witnesses that may be heard in behalf of a party on any issue.

(g) Any party desiring to present his case in whole or in part by affidavit may do so by adhering to the following procedure:

(1) Affidavits must be limited to material facts personally known to affiants and must not contain expressions of opinion, argument, or conclusions;

(2) Only the affidavits of parties and their respective agents and employees will be received;

(3) Copies of all affidavits intended to be used in any hearing must be served upon or mailed to the commission and all parties notified of the hearing not less than 15 days prior to the hearing date and no affidavits will be received or considered by the commission unless accompanied by a further affidavit by the party, his agent or attorney, stating that this requirement has been met;

(4) Any party to a hearing may, upon the receipt of a copy of an affidavit from any other party, as provided in the foregoing subparagraph (3), prepare and file counteraffidavits which shall be limited in their scope to an explanation or denial of the facts alleged in the affidavits to which they relate.

SUBTITLE E.—INFORMAL HEARINGS AND THE CONDUCT THEREOF

SECTION 1. Method of obtaining and procedure.—The commission may, upon petition by any person or upon its own motion, hold such informal hearings as it may deem necessary from time to time in connection with the investigation of any matter which it has power to investigate under the law, or for the purpose of obtaining information necessary or helpful in the determination of its policies, the carrying out of its duties, or the formulation or amendment

⁴ "Band" or "band of frequencies" as used herein shall be taken as referring to the major bands, namely, low (10 to 100 kilocycles), medium (100 to 550 kilocycles), broadcast (550 to 1,500 kilocycles), medium high (1,500 to 6,000 kilocycles), high (6,000 to 30,000 kilocycles), and very high (above 30,000 kilocycles).

of its rules and regulations. For such purposes, it may summon witnesses and require the production of testimony as in formal hearings, but the procedure to be followed shall be informal and such as in the opinion of the commission will best serve the purposes of such hearing.

SUBTITLE F.—PREPARATION OF RECORD ON APPEAL

SECTION 1. Preparation and stipulation by general counsel.—Where an appeal is taken from a decision of the commission to the Court of Appeals of the District of Columbia or to a district court in the United States, the record required to be filed in such court by section 16 of the radio act of 1927 shall be prepared under the supervision of the general counsel of the commission and shall be certified by the secretary of the commission. The general counsel shall have power to stipulate with the appellant to such extent as may be necessary to omit unnecessary matter from the record, provided that the interests of neither the commission nor of any other party to the record is adversely affected by such omission.

SEC. 2. Stipulation between parties.—Where the case has been in its essential nature a controversy between two or more parties and no interest of the commission or of the public is involved, the general counsel will observe and give effect to any stipulation entered into between the parties as to what matters shall or shall not be included in the record.

SUBTITLE G.—GENERAL ORDERS

SECTION 1. Scope, promulgation, and effective date.—Such action by the commission as affects a large number of persons and does not arise out of a formal hearing, such as the enactment of further regulations or as an amendment to these regulations, shall be taken by general order which shall be promptly promulgated by the secretary, shall be numbered serially, and shall bear both the date of adoption and the effective date.

GENERAL ORDER No. 94

JUNE 26, 1930.

It is ordered that:

1. Upon proper application of any companies or agencies maintaining, or proposing to maintain, aeronautical stations, if the commission is satisfied that the particular applicant is qualified and that the issuance of the license or licenses in question would serve public interest, convenience, or necessity, frequencies will be designated solely for use by all of said stations which comprise a continuous series of stations, or chain, along a particular airway.

2. Aeronautical stations licensed pursuant to this plan will provide adequate service, without discrimination, for all and any aircraft of whatever nature. In the interest of economy in the use of frequencies, to coordinate the radio facilities and secure the maximum flexibility, it is required that, where the service provided by a chain is regularly used, as distinguished from casual, incidental, or emergency use, the owners of the aircraft which use such chain or chains shall cooperate among themselves as to the operation, maintenance, and liability of the stations; provided, however, that nothing herein shall impose upon the commission any authority or responsibility whatever with reference to the private business or transactions of any licensee.

3 All frequencies assigned for aviation purposes shall be designated in three classes, as follows:

(a) Frequencies used by aeronautical or aircraft stations on a chain or chains for communication purposes either between aeronautical stations and aircraft or between aeronautical stations.

(b) Frequencies used for distress, calling, and aids to navigation.

(c) Experimental frequencies will include all frequencies assigned for aviation purposes other than those set forth in (a) and (b). All such experimental frequencies may be changed by the commission during the term of the license without advance notice or hearing, and all licenses shall take these experimental frequencies subject to this express condition.

4. The distress, calling, and navigational frequencies shall be assigned as follows:

- 278 kilocycles. Calling and working frequency from all ground stations to itinerant aircraft. Power not to exceed 15 watts. Required for all ground stations.
- 333 kilocycles. International air calling frequency to be used only for international flights. Primarily not for assignment in the United States.
- 375 kilocycles. Radio compass.
- 500 kilocycles. International calling and distress frequency for ships and aircraft over the seas.
- 3,108 kilocycles. National calling and working frequency for all itinerant aircraft. May also be assigned to transport aircraft in addition to chain frequencies.
- 5,525, 11,050, and 16,580 kilocycles. Primarily for coastal stations and ships. May also be assigned to aircraft only for the purpose of calling a coastal station or ship when aircraft is in flight over the sea.
- 393, 400, 414, 420, and 457 kilocycles. For aircraft and stations on chains desiring to use intermediate frequencies except where interference may be caused with other services.
- 414 and 457 kilocycles. Working frequencies for aircraft on sea flights desiring intermediate frequencies. Those desiring high frequencies may use the frequencies designated for maritime calling and working.

5. The frequencies 12,180 and 12,210 kilocycles, designated by the President as reserved for Government experimental stations but available for assignment to commercial companies subject to recall by the Government upon six months' notice, are made available on such temporary basis for aeronautical point-to-point communications on chains during daylight hours only; provided, however, that applicants desiring the use of such frequencies can show, by reason of distance to be covered, that such frequencies are necessary.

6. Frequencies licensed for use by aeronautical stations shall not be used for point-to-point service except--

(a) Where frequencies are allocated to a chain and cooperatively used as described in paragraph 2, a point-to-point service will be licensed upon application on frequencies to be designated, provided that the use of such service shall be open to all of the cooperative participants upon an equal basis and then only to the extent of the actual aviation needs of the users.

(b) That at all times the licensee of point-to-point service shall be required to transmit, without charge or discrimination, emergency messages for the general public which involve the safety of life or property.

7. In no event shall the use of any frequency by a licensee extend to commercial correspondence or to paid or toll messages in the sense in which these terms are generally understood and accepted.

8. The chains shall be established as indicated upon a map to be maintained by the commission, and this map shall show (1) the location of all aeronautical stations, (2) all navigational aids, (3) the frequencies allocated by the commission, and (4) as nearly as possible all proposed chains (following, connecting with, or independent of existing chains).

9. The initial chains shall be established as indicated upon this map in colored lines, the colors having the following designations:

BLUE CHAIN

From Kansas City, Kans.
 Through Wichita, Kans.
 Amarillo, Tex.
 Albuquerque, N. Mex.
 Holbrook, Ariz.
 Flagstaff, Ariz.
 Kingman, Ariz.
 Barstow, Calif.
 To Los Angeles, Calif.

From Los Angeles—
 Through San Diego, Calif.
 El Centro, Calif.
 To Phoenix, Ariz.
 From Los Angeles, Calif.
 To San Francisco, Calif.

BLUE CHAIN—continued

From San Francisco, Calif.
 Through Redding, Calif.
 Montague, Calif.
 Medford, Oreg.
 Portland, Oreg.
 To Seattle, Wash.
 From Dallas, Tex.
 Through Fort Worth, Tex.
 Midland, Tex.
 Abilene, Tex.
 El Paso, Tex.
 Douglas, Ariz.
 Tucson, Ariz.
 Phoenix, Ariz.
 To Los Angeles, Calif.
 From Los Angeles, Calif.
 Through Barstow, Calif.
 Las Vegas, Nev.
 To Salt Lake City, Utah.

From Cheyenne, Wyo.
 Through Denver, Colo.
 Pueblo, Colo.
 Trinidad, Colo.
 Santa Fe, N. Mex.
 Albuquerque, N. Mex.
 To El Paso, Tex.
 From Pueblo, Colo.
 Through Amarillo, Tex.
 Wichita Falls, ex.
 To Dallas, Tex.
 From Amarillo, Tex.
 Through Oklahoma City, Okla.
 To Tulsa, Okla.

BROWN CHAIN

From Boston, Mass.
 Through Hartford, Conn.
 To New York City.
 From New York City.
 Through Albany, N. Y.
 To Montreal, Canada.
 From Albany, N. Y.
 Through Buffalo, N. Y. (cross
 Lake Ontario).
 Cleveland, Ohio.
 Bryan, Ohio.
 Chicago, Ill.
 Kansas City, Kans.
 To Omaha, Nebr.
 From Chicago, Ill.
 Through Indianapolis, Ind.
 To Cincinnati, Ohio.
 From Chicago, Ill.
 Through Springfield, Ill.
 St. Louis, Mo.
 To Kansas City, Mo.
 From St. Louis, Mo.
 Through Covington, Ky.
 To Nashville, Tenn.
 From Kansas City, Mo.
 Through Tulsa, Okla.
 Fort Worth, Tex.
 Dallas, Tex.
 Big Springs, Tex.
 To El Paso, Tex.

From Chicago, Ill.
 Through Terre Haute, Ind.
 Nashville, Tenn.
 Chattanooga, Tenn.
 Atlanta, Ga.
 Birmingham, Ala.
 Mobile, Ala.
 New Orleans, La.
 Beaumont, Tex.
 Houston, Tex.
 Waco, Tex.
 To Fort Worth, Tex.
 From Waco, Tex.
 Through San Antonio, Tex.
 To Brownsville, Tex.
 From Washington, D. C.
 Through Pittsburgh, Pa.
 Cleveland, Ohio.
 Columbus, Ohio.
 Dayton, Ohio.
 Cincinnati, Ohio.
 To Louisville, Ky.
 From Chicago, Ill.
 Through La Crosse, Wis.
 St. Paul, Minn.
 Minneapolis, Minn.
 Fargo, N. Dak.
 To Canada.

GREEN CHAIN

From Trenton, N. J.
 Through Philadelphia, Pa.
 Washington, D. C.
 Richmond, Va.
 Greensboro, N. C.
 Spartanburg, S. C.
 Atlanta, Ga.
 Jacksonville, Fla.

To Miami, Fla.
 Tampa, Fla.

From Newark, N. J.
 Through Scranton, Pa.
 Cleveland, Ohio.

To Bryan, Ohio.
 Chicago, Ill.

From Columbus, Ohio.
 Through Indianapolis, Ind.
 St. Louis, Mo.
 Kansas City, Mo.
 Wichita, Kans.
 Amarillo, Tex.
 Clovis, N. Mex.
 Albuquerque, N. Mex.
 Winslow, Ariz.
 Flagstaff, Ariz.
 Seligman, Ariz.
 Kingman, Ariz.
 Barstow, Calif.

To Los Angeles, Calif.

From Los Angeles, Calif.
 To San Diego, Calif.

From Los Angeles, Calif.
 To San Francisco, Calif.

From Chicago, Ill.
 Through Dixon, Ill.
 St. Joseph, Mo.

To Kansas City, Mo.

From Wichita, Kans.
 Through Oklahoma City, Okla.
 Tulsa, Okla.
 Ardmore, Okla.

To Fort Worth, Tex.

RED CHAIN

From Cleveland, Ohio.
 Through Detroit, Mich.
 Kalamazoo, Mich.
 Chicago, Ill.
 Iowa City, Iowa.
 Cedar Rapids, Iowa.
 Des Moines, Iowa.
 Council Bluffs, Iowa.
 Lincoln, Nebr.
 North Platte, Nebr.
 Cheyenne, Wyo.
 Rock Springs, Wyo.
 Salt Lake City, Utah.
 Helena, Mont.

To Great Falls, Mont.

From Salt Lake City, Utah.
 Through Elko, Nev.
 Reno, Nev.
 Sacramento, Calif.

To San Francisco, Calif.

From Los Angeles, Calif.
 Through Bakerfield, Calif.
 Fresno, Calif.

To San Francisco, Calif.

From San Francisco, Calif.
 Through Redding, Calif.
 Medford, Oreg.
 Portland, Oreg.
 Tacoma, Wash.

To Seattle, Wash.

From Portland, Oreg.
 Through Baker, Oreg.
 Pasco, Oreg.

To Spokane, Wash.

From Salt Lake City, Utah.
 Through Boise, Idaho.

To Pasco, Oreg.

YELLOW CHAIN

From New York, N. Y.
 To Washington, D. C.

From New York, N. Y.
 Through Atlantic City, N. J.
 Norfolk, Va.
 Wilmington, N. C.
 Charleston, S. C.
 Savannah, Ga.
 Jacksonville, Fla.
 Miami, Fla.

To Key West, Fla.

From Miami, Fla.
 Through San Juan, P. R.
 St. Thomas, Virgin Islands.

To Habana, Cuba.

From Brownsville, Tex.
 To Mexico.

10. Frequencies are designated for use on the chains as follows:

Brown chain, 5,600 and 3,484.	Red chain, 5,660 and 3,172.
Blue chain, 3,070, 3,088, 3,460, 6,350, 8,015 (day only), and 12,180 (day only).	Yellow chain, 8,015 (day only), 5,690, 2,662, and 3,070.
Green chain, 2,344 and 3,468.	

11. In all cases herein where the word "day" occurs in connection with a specific frequency, such use of the word "day" shall be construed to mean that period of time included between 2 hours after local sunrise and 2 hours before local sunset. If, for any reason, it is impossible to shift from a day to a night frequency at the exact time required, such shift in frequency shall be made at the earliest possible moment and, with respect to any aircraft, under no circumstances shall the use of a day frequency be continued at night after such aircraft has once landed at one of the regular airports along its route, following the time when such shift is required to be made.

12. No aeronautical station will be licensed to use more than 1 kilowatt power on frequencies of 1,500 kilocycles and above.

13. All aeronautical stations will maintain a watch on such frequencies and for such periods of time as the Assistant Secretary for Aeronautics of the Department of Commerce may designate.

14. For the purpose of the foregoing, two types of aircraft are defined:

(a) Transport aircraft—those commercially transporting persons and/or property and operating regularly on fixed routes.

(b) Itinerant aircraft—all those other than transport or Government aircraft.

15. An aeronautical station shall be defined as one being capable of giving—

(1) Ground-to-aircraft communication.

(2) Point-to-point communication (provided frequencies have been designated for this service pursuant to par. (a) of sec. 6).

(3) Distress, calling, and navigational service.

16. Licenses, both of aeronautical and aircraft stations, shall install equipment of such construction and efficiency as will assure the service which the station is intended to give.

17. All licenses, whether aircraft or aeronautical, shall be posted at all times in a conspicuous place in the station so licensed. The license of every station operator shall be available for inspection at all times while he is on duty.

18. This order is, and shall be, construed as a regulation of the commission, violation of which will be cause for revocation of license as provided by the act of 1927, as amended.

It is further ordered that all general orders or parts thereof and all rules and regulations in conflict herewith be, and the same are hereby, repealed.

REPORT OF THE GENERAL COUNSEL

THAD H. BROWN

(Bethuel M. Webster served as general counsel until December 15, 1929)

I. PERSONNEL AND ORGANIZATION

The increase in the work of the commission during the fiscal year ending July 1, 1930, was accompanied by a corresponding increase in the work of the legal division. This was caused by greater volume of work of the sort summarized in previous annual reports as well as the creation of new duties and the presentation of entirely new and novel problems arising out of the continued efforts of the commission to more effectively administer the provisions of the act. This increase in the volume and kind of work has not only called for an increased personnel but has required a reorganization of the legal division into sections with more clearly defined duties and responsibilities and with correspondingly greater opportunities for specialization.

The legal division as reorganized by the general counsel is divided for the purpose of administration into three principal sections, each under the immediate supervision of an assistant general counsel who is in turn directly responsible to the general counsel.

I. THE GENERAL COUNSEL'S OFFICE

The general counsel personally handles or personally assigns all court matters of the commission, including briefs, records on appeal, and the like, as well as the presentation of all matters in court. It is the office of the general counsel to examine, pass upon, and approve or reject all matters emanating from various sections of the legal division and for this purpose all correspondence or other documents emanating from any of said sections or subsections is prepared for his signature. It is likewise the duty of the general counsel or some one designated by him to perform certain important administrative duties in connection with the handling of interdepartmental affairs and to interview representatives of the public and parties having matters pending before the commission. A great deal of the time of the general counsel is consumed in this manner.

2. ADMINISTRATIVE SECTION

This section has been divided into the following subsections whose respective duties are classified substantially as follows:

(a) *Application and form subsection.*—This subsection is responsible for the preparation and revision of forms of application and authorization and such other forms relating to the administrative

or routine work of the commission as the legal division is called upon to prepare, revise, or approve. It maintains a complete file of such forms which is at all times made available to the commission and other commission personnel properly interested. All applications for licenses and authorization involving legal questions are referred to this subsection where they are examined and the recommendation of the legal division with respect thereto is made.

(b) *Complaint and investigation subsection.*—This subsection has charge of all complaints referred to the commission with reference to licenses and applicants. It maintains a file of such matters, correlates the same, and sees that all papers and documents in connection with such complaints are in proper form and available to the commission and others properly interested. It maintains a permanent complaint and investigation record showing the name of the licensee or applicant complained of, the nature and date of the complaint, and by whom made, together with all other necessary or proper information with respect thereto. Such cases as are of sufficient merit or importance to require immediate or further action are referred through the general counsel for commission action and when the commission orders any matter to be referred to any other governmental department or agency, this subsection is responsible for transferring such matter and all documents and information with respect thereto and forms the liaison between the commission and such other governmental department or agency. The chief investigator is also under the supervision of this subsection which cooperates with the radio division of the Department of Commerce in all such matters.

3. HEARING AND RECORD SECTION

This section is responsible for all questions arising upon the record made in formal hearings conducted by the commission, the commissioners, or examiners. The head of this section or some one designated by him attends all such hearings and advises with the person or persons conducting the hearings as to the status of the matter being heard and the rights of all proper parties to the record or in interest, compliance with the rules and regulations of the commission, the admissibility of evidence, and such other questions of like character as may arise. The representative of this section cross-examines witnesses on behalf of the commission and presents evidence in its behalf, avoiding at all times the advocacy of the claims of individual parties except in so far as to sustain the position of the commission. This section is responsible for the preparation of the commission's cases for hearing and for this purpose confers and advises with the commission, other divisions of the commission personnel, representatives of other governmental departments and agencies, and all others properly interested or possessed of information necessary for the preparation of the commission's case. It is the duty of this section to collect, correlate, and file all exhibits and other matter proper and necessary to be incorporated into the record on appeal under section 16 of the radio act or in any way essential to other litigation in which the commission may be involved as a result of any hearing.

4. RESEARCH AND DRAFTING SECTION

It is the duty of this section to maintain a file of the "Opinions of the general counsel" and to draft, correlate, and index all such new opinions. It has prepared and maintains a file of all legal memoranda prepared in the legal division which is correlated and made available in proper form to all members of the legal division and other commission personnel properly interested. Under the direction of the commission it prepares all proposed rules and regulations, general orders, minutes, and the like; and receives, collects, and appraises suggestions and material for the preparation or amendment of all documents heretofore referred to. This section collects all available foreign laws and treaties with respect to regulation of radio communication, all reports of national or international conventions, and is charged with the gathering, correlation, and tabulation of material and legal data in the preparation of the annual report as well as all proposed legislative amendments, when so requested. This section also has charge of maintaining the library of the commission and keeping the same up to date, and, except when otherwise specifically directed by the general counsel, briefs in all cases in which the commission is a party are prepared under the supervision of this section.

II. WORK OF THE FISCAL YEAR

1. FORMAL HEARINGS ON APPLICATIONS

During the past year 8,543 applications for various instruments of authorization were received by the commission. In 944 cases the commission was unable to determine without a hearing that such applications should be granted and they were scheduled for hearing. Under the practice then in effect applicants were notified of the fact that an application had been designated for hearing and were given an opportunity to be heard provided the commission received a reasonable notice to that effect. Three hundred and twenty-three cases were placed on the calendar for hearing upon receipt of notices that the respective applicants desired hearings.¹ Thirty-two applications were denied by default at hearing date; 240 formal hearings were actually held; 159 applications were denied after hearing; and 77 applications were granted after hearing.² Following the decision of the commission in 36 cases appeals were taken to the Court of Appeals of the District of Columbia. Of the 240 cases heard during the fiscal year only 3 were undecided during that period.

Pursuant to commission practice in such matters, each application received by the commission was examined and passed upon (except identical renewals in certain cases) by the legal division prior to commission action thereon. In all cases set for hearing notices and documents were sent to the applicants and others who were or might be affected by any decision rendered in the matter, and in all cases which actually reached the hearing stage the cases were

¹ The balance of the applications scheduled for hearing were denied on failure of applicants to reply to hearing notice, dismissed at request of applicants, or continued for hearing during the fiscal year 1931.

² The docket cases not accounted for were reconsidered and granted before hearing date, dismissed at request of applicant, or continued.

prepared for hearing by the legal division, and one or more members of the division attended the hearings, examined and cross-examined witnesses, and presented the commission or public side of the controversy.

2. INFORMAL HEARINGS AND GENERAL ORDERS

During this period the legal division assisted the commission in the preparation of 24 general orders or regulations of general application. In certain cases these general orders were enacted and promulgated as a result of informal hearings held by the commission for the purpose of obtaining information and the views of representatives of the parties to be affected. In such cases representatives of the legal division attended and assisted the commission in the conduct of such hearings.

3. FORMAL AND INFORMAL OPINIONS

During this period the legal division prepared and submitted to the commission a number of opinions on questions involving the interpretation and application of the radio act. These opinions were for the most part informal and are contained in intradepartmental memoranda and correspondence and as such are not made available to the public except on special request therefor. They were, however, correlated and indexed by the division and are available for future use.

4. STATEMENT OF FACTS AND GROUNDS FOR DECISION

The commission is required under the terms of section 16 of the radio act of 1927, as amended, to prepare and file in the appropriate court a "full statement in writing of the facts and grounds for its decision as found and given by it" in all cases where an appeal is taken from the commission's decision.³ The legal division has assisted the commission in the preparation of such statements in each of the 36 cases in which appeals have been taken during the fiscal year last past. In compliance with the statutory mandate these statements have included a résumé and summary of the pertinent and salient facts as well as a statement and consideration of legal questions involved, if any.

While no arrangement has yet been made for the regular publication of these statements, the commission has caused a sufficient number of copies to be prepared so that they are available to interested parties upon request. Cases in which statements have been prepared and filed during the period herein reported are as follows:

- No. 5003. Southwestern Sales Corporation, July 10, 1929.
- No. 5004. Norman Baker, July 10, 1929.
- No. 5005. Universal Service Wireless (Inc.), July 10, 1929.
- No. 5090. Isle of Dreams Broadcasting Co., November 7, 1929.
- No. 5092. Triangle Broadcasters, November 11, 1929.
- No. 5093. Victor C. Carlson, November 11, 1929.
- No. 5094. Fred L. Schoenwolf, November 11, 1929.

³ This section was amended on the 1st day of July, 1930, in other respects, but this provision of the original act remains unchanged.

- No. 5095. The Journal Co., November 11, 1929.
 No. 5104. Westinghouse Electric & Manufacturing Co., November 19, 1929.
 No. 5105. Westinghouse Electric & Manufacturing Co., November 19, 1929.
 No. 5112. Northwest Broadcasting System (Inc.), December 12, 1929.
 No. 5117. WMAK Broadcasting Station (Inc.), December 21, 1929.
 No. 5118. Wilmington Transportation Co., December 24, 1929.
 No. 5125. The Onondago Co., January 9, 1930.
 No. 5126. Arthur Faske, January 9, 1930.
 No. 5141. Havens & Martin (Inc.), February 6, 1930.
 No. 5150. Westinghouse Electric & Manufacturing Co., February 19, 1930.
 No. 5149. W. O. Ansley, jr., February 19, 1930.
 No. 5151. John Ulrich, February 20, 1930.
 No. 5158. Rev. Lannie W. Stewart, March 3, 1930.
 No. 5163. The Journal Co., March 11, 1930.
 No. 5190. The Courier-Journal Co. and the Louisville Times Co., April 23, 1930.
 No. 5196. General Broadcasting System (Inc.), April 25, 1930.
 No. 5192. Westinghouse Electric & Manufacturing Co., April 25, 1930.
 No. 5207. American Fisherman's Protective Association, May 10, 1930.
 No. 5204. Missouri Broadcasting Corporation and C. W. Benson, May 13, 1930.
 No. 5208. J. E. Bennett Music Co., May 10, 1930.
 No. 5225. Jay Peters (Inc.), June 2, 1930.
 No. 5227. Shortwave & Television Laboratory (Inc.), June 4, 1930.
 No. 5228. William B. Schaeffer, June 5, 1930.
 No. 5240. KFKB Broadcasting Association (Inc.), June 16, 1930.
 No. 5245. Carl S. Wheeler (Lexington Air Stations), June 17, 1930.
 No. 5253. Marquette University, June 26, 1930.
 No. 5264. Horace D. Good, June 27, 1930.
 No. 5257. The Ann Arbor Railroad Co., June 28, 1930.
 No. 5256. Pere Marquette Railway Co., June 28, 1930.

5. PENDING LITIGATION

The termination of the fiscal year finds a greater number of cases to which the commission is a party pending in the courts. In all there were 31 such cases. While the preparation and trial of cases to which the commission is a party has consumed a great deal of the time of this division and has been largely responsible for the required increase and reorganization of its personnel, such a condition is quite natural in view of the relatively unsettled condition of this branch of the law and the holding of the Supreme Court of the United States in the case of *Federal Radio Commission v. General Electric Co. et al.*⁴ (281 U. S. 464; 74 L. ed. 969.)

The following summary will serve to briefly identify the cases in court, the principal issues involved, and their status:

I. COURT OF APPEALS OF THE DISTRICT OF COLUMBIA

- No. 4987. *Intercity Radio Telegraph Co. v. F. R. C.*
 No. 4988. *Wireless Telegraph & Communications Co. v. F. R. C.*
 No. 4990. *R. C. A. Communications (Inc.) v. F. R. C.*
 No. 4991. *Mackay Radio & Telegraph Co. v. F. R. C.*

These appeals all relate to a controversy arising out of certain decisions of the Federal Radio Commission refusing to authorize the issuance of station licenses and construction permits for point-to-point communication within the United States. The principal issues involved in these appeals are: Whether the Court of Appeals of the District of Columbia can pass on rights of parties not before

⁴ In this case the jurisdiction of the Court of Appeals was declared to be that of an administrative tribunal. (See p. 50, post.)

it; and what consideration and weight (if any) ought to be given to priority of existing stations in the communication field carrying on (a) the same service as that applied for by later applicants, or (b) a different service; priority in the matter of the filing of applications; and the application of the standard of "public interest, convenience, and necessity" to public point-to-point communication.

All parties to these appeals have filed briefs and plaintiffs will file reply briefs by August 15. Oral argument will be presented to the Court of Appeals of the District of Columbia early in the fall term.

No. 5095. *The Journal Co., a corporation, v. F. R. C. (station WTMJ).*

This is an appeal from an order of the commission granting a license to the applicant, but by him claimed not to be in accordance with the terms of his applications because licenses were granted other applicants whose operation is alleged to have reduced appellant's "service area." The primary questions are whether the act permits an appeal from a decision of the commission in so far as said decision may reduce the service area of appellant's broadcasting station, and whether a hearing is necessary when the commission puts other stations on the same frequency as existing stations.

Nos. 5104, 5105, and 5150, *Westinghouse Electric & Manufacturing Co. v. F. R. C.*

These appeals grew out of certain action of the commission relating to applications of appellant for renewal of licenses for its broadcasting stations KYW, KFKX, and KYA, located at Chicago, Ill. The renewal licenses contained language to the effect that they were issued with the specific understanding that the cleared channel of frequency of 1,020 kilocycles had been allocated for use by stations in the second zone created by section 2 of the radio act of 1927, and they were issued for a temporary period of 90 days and would not be renewed provided application therefor was made for the use of 1,020 kilocycles by a proper applicant within the second zone. It is contended by appellant that this provision in the licenses constitutes a denial of its applications. The commission moved to dismiss on the ground that there was no denial of appellant's applications and the use of 1,020 kilocycles by it originally was temporary and known to be so by appellant. The principal issue presented is whether the decisions of the commission are ones from which an appeal may be taken under section 16 of the act. Briefs are due by both parties early in the fall and these appeals will be argued orally before the Court of Appeals at the next term of court.

No. 5141. *Havens and Martin v. F. R. C.*

This is an appeal from an order of the commission denying an application for a construction permit seeking an increase in power with a regional frequency assignment for station WGBM at Richmond, Va. The issues include an interpretation of "public interest, convenience, and necessity" as used in the radio act of 1927, and the Davis amendment to the radio act of 1927. The record in this appeal has been filed, and briefs will be forthcoming by both parties in the early fall. Oral argument may be reached the next term of court.

No. 5149. *W. O. Ansley, jr., v. F. R. C.*

This is an appeal from an order of the commission denying an application for a construction permit to build a station in the city of Abilene, Tex. The questions raised by this appeal are mostly questions of fact relating to the service Texas is getting and probable interference if the application of appellant were granted. An interpretation of the statutory stand and of "public interest, convenience, and necessity" as applied to the particular facts of that case is also involved. The quota figures promulgated by the commission under the provisions of the amendatory act of March 28, 1928, are challenged in this appeal as well as certain procedure of the commission. The record has been printed in this appeal and appellant's brief is due shortly.

No. 5190. *The Courier-Journal Co. and the Louisville-Times Co. v. F. R. C.*

This appeal arises by virtue of a change in the frequency assignment of station WHAS pursuant to a clear channel shift undertaken by the commission's General Order No. 87, and subsequent amendments thereto, to alleviate cross-talk interference which was promulgated by virtue of section 4 (f) of the radio act of 1927, as amended. It is contended by appellant that General Order No. 87 is not a reasonable exercise of the powers of the commission, and that the action of the commission taken pursuant thereto affecting a change of the frequency on which station WHAS was licensed to operate, constitutes an appealable decision of the commission. The commission contends that General Order No. 87, as amended, is a valid exercise of its regulatory powers affecting all stations of a particular class so that its action taken pursuant thereto changing the frequency assignment of station WHAS does not constitute an appealable decision of the commission under section 16 of the radio act of 1927, as amended. The record in this case has not yet been printed.

No. 5163. *The Journal Co. v. F. R. C.*

This is an appeal from an order of the commission denying appellant's application for modification of station license (WTMJ). This station is at Milwaukee, Wis., and had been operating on the frequency of 620 kilocycles with a power output of 1 kilowatt and an additional 1½ kilowatts for experimental purposes. Its application, the denial of which gave rise to these proceedings, requested an increase in power to 5,000 watts. The Journal Co. attacks General Order No. 40 of the commission by their appeal and propose in place of the 10 kilocycles separation of stations adhered to by that order, a plan for 50 clear channels or frequencies with a 10-kilocycle separation, and a 7½-kilocycle separation for all others. The record has been printed in this appeal and appellant's brief is due in the near future.

No. 5192. *Westinghouse Electric & Manufacturing Co. v. F. R. C.*

This appeal, unlike the other three former Westinghouse appeals, grew out of the clear-channel shift made by the commission pursuant to General Order No. 87, as amended. It raises various issues, including virtually the same questions as those in the Courier-Journal Co. and the Louisville Times Co. appeal. The record in this appeal is not yet printed.

No. 5196. General Broadcasting Co. *v.* F. R. C.

This appeal is taken from an order of the commission denying appellant's application for renewal of station license (WGBS) for the use of the frequency of 600 kilocycles; power output 500 watts (day), 250 watts (night); limited time. The station had been given the use of this frequency temporarily and experimentally because it was only 30 kilocycles away from another station operating in the same geographical area of metropolitan New York, this being less than the separation generally accepted by the leading engineers of the country for satisfactory service. The principal issue is one of fact; viz, whether interference resulted by reason of the operation of station WGBS only on 600 kilocycles, only 30 kilocycles away from stations WMCA and WNYC, all in New York City. The application of the amendatory act, approved March 28, 1928, is also in question. The record has not yet been printed in this case, but is due early in the fall.

No. 5204. Missouri Broadcasting Corporation and C. W. Benson *v.* F. R. C.

This is an appeal from an order of the commission denying the application of the Missouri Broadcasting Station for a construction permit seeking the use of the frequency of 1,350 kilocycles for station WIL with a power output of 1,000 watts. Besides the issue of fact, viz, whether the evidence of comparative showing of public interest of the stations involved in this appeal support the commission's decision, there is this question of law: Is proof of improper use of facilities by a licensee sufficient to entitle any other applicant to the use thereof, without further proof of its serving public interest, convenience, and necessity? The record in this case has not yet been printed.

No. 5207. American Fisherman's Protective Association *v.* F. R. C.

This is an appeal from an order of the commission denying an application for a construction permit to erect a transmitter for private shore to ship communication. No new question of law is presented, the sole issue being whether it is in the public interest, convenience, or necessity to grant the application applied for. The record in this case has not yet been printed.

No. 5208. J. E. Bennett Music Co. *v.* F. R. C.

This is an appeal from an order of the commission denying a construction permit to erect a station at Cordell, Okla., for the use of 1,360 kilocycles with a power output of 100 watts. No question of law is involved in this appeal. The only questions of fact arising herein relate to interference and whether the commission's finding that public interest would not be served by the granting of the appellant's application is supported by the evidence. The record in this case has not yet been printed.

No. 5227. Shortwave & Television Laboratory (Inc.) *v.* F. R. C.

This appeal arose as a result of the commission's denial of appellant's application for a construction permit to build a station at Boston, Mass., for the use of the frequency of 1,370 kilocycles with a power output of 100 watts (night) and 250 watts (day). The principal issue is one of fact, viz, whether the evidence supported the

commission's finding that public interest would not be served by granting the application applied for. Commission procedure is questioned by this appeal also. The record has not yet been printed.

No. 5228. William B. Schaeffer, doing business as Schaeffer Radio Co., *v.* F. R. C.

The commission denied the application of appellant for renewal of its station (KVEP) license to operate at Portland, Oreg., on the frequency 1,490 kilocycles, unlimited time of operation with a power output of 15 watts. This appeal raises squarely these questions: What is obscene and indecent language as contemplated by the act and can the commission indirectly censor station programs for "indecent and obscene" language? The record in this case is not yet printed.

No. 5240. KFKB Broadcasting Association (Inc.) *v.* F. R. C.

Like the foregoing appeal, this arose out of a denial of an application to renew the station's license. This appeal raises the question: How far can the commission go in its indirect censorship of programs, determining what is or is not in the public interest? The record in this case has not yet been printed.

No. 5245. Carl S. Wheeler, doing business as Lexington Air Stations, *v.* F. R. C.

This is an appeal from an order of the commission denying an application for a construction permit seeking to move station WLEX from Lexington to Worcester, Mass. The issues in this appeal are chiefly an issue of fact, viz, whether the granting of the application is in the public interest; an issue of law, viz, can the commission accept a showing of service in the public interest from parties other than the licensee?

No. 5264. Horace D. Good, trading as the Avenue Radio and Electric Shop, *v.* F. R. C.

The commission denied the appellant's application for a construction permit and from this order an appeal was taken. Appellant attacks certain procedure of the commission in his appeal, but the principal issue is one of fact, viz, whether the granting of the application would serve public interest. The record in this appeal has not yet been designated.

No. 5253. Marquette University, a corporation (Station WHAD) *v.* F. R. C.

This is an appeal from an order of the commission denying appellant's application for modification of its station license. The issues involved in this appeal include the application of the so-called Davis amendment to the radio act of 1927, approved March 28, 1928, and the legislative standard of public interest. The commission's statement and record have not yet been filed.

No. 5256. Pere Marquette Railway Co. *v.* F. R. C.

No. 5257. Ann Arbor Railroad Co. *v.* F. R. C.

These appeals arose by reason of orders of the commission denying renewal applications for commercial point-to-point and coastal service. They involve the question of whether it is in the public interest to grant the applications made herein to parties not engaged

primarily in a general communications business. The commission's "Statement of fact and grounds for decision" has not yet been filed.

II. UNITED STATES DISTRICT COURT OF CONNECTICUT

No. 2064. Bridgeport Broadcasting Station (Inc.) *v.* F. R. C.

This appeal was taken from a decision of the Federal Radio Commission which, appellant contends, had the effect of revoking its station license. It raises the questions whether the action of the commission taken pursuant to stay orders issued by the Court of Appeals of the District of Columbia constitutes a "revocation" of the station license of appellant within the meaning of section 16 of the radio act of 1927, as amended, and whether the Court of Appeals of the District of Columbia has power to issue a "stay order" in a matter over which it does not have appellate jurisdiction under the radio act of 1927, as amended.

The commission's statement of facts and record have been filed and a temporary restraining order granted by the court. The General Broadcasting Co. has been allowed to intervene, and its motion to dismiss the appeal and dissolve the temporary restraining order has not been acted upon by the court as yet.

III. SUPREME COURT OF THE DISTRICT OF COLUMBIA

Equity No. 51439. The Baltimore Radio Show (Inc.), a Corporation, et al. *v.* F. R. C.

This is a suit for an injunction against the commission to enjoin it from allowing the Baltimore Broadcasting Co. to operate its station (WCBN) upon a frequency of 60 kilocycles away from that upon which appellant operates its station (WFBR). Plaintiff's contention is that the operation of station WFBR, located geographically so close to station WCBN, 60 kilocycles apart, will cause a reduction of its service area. It raises a question of fact, first, as to whether the action complained of does affect a reduction of plaintiff's station's service area, and second, a question of law: Does a license to operate a station on a given frequency with a given power output entitle the station to a "service area" to the limit of such facilities?

Equity No. 51325. Stromberg-Carlson Telephone Manufacturing Co., a Corporation, *v.* F. R. C.

This is a suit for an injunction growing out of the commission's General Order No. 87 and subsequent amendments to enjoin the commission from changing the frequency assignment of the plaintiff's radio broadcasting station (WHAM) and to restrain and enjoin the commission from assigning any other radio station to the frequency used or to be used by plaintiff's radio station (WHAM).

The Supreme Court of the District of Columbia granted plaintiff's motion for preliminary injunction, and the commission appealed from this order granting the same on the ground that the court's order placed the burden of proof in showing why the changes made by the commission's General Order No. 87 should not be made on the commission, contrary to the provisions of the radio act of 1927.

The validity of the commission's General Order No. 87 and amendments thereto is in issue as well as certain other commission procedure.

The record will be certified to the Court of Appeals of the District of Columbia in the near future.

IV. UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF ILLINOIS

The Agricultural Broadcasting Co. has filed a suit for injunction against the individual commissioners as the Federal Radio Commission and the Great Lakes Broadcasting Co. to restrain the commission from enforcing against it the order of the court of appeals reducing the time of operation of its station WLS from 5/7 to 1/2. The validity of the order of the Court of Appeals of the District of Columbia is in question, and also whether or not there is a property right in a license as between two individual stations which may be protected by injunction.

The commission will move to dismiss on the grounds of lack of jurisdiction over any of the commissioners.

V. SUPREME COURT OF THE UNITED STATES

American Bond & Mortgage Co. v. F. R. C.

This appeal was taken to the circuit court of appeals from a decree entered by the District Court for the Northern District of Illinois, perpetually enjoining the American Bond & Mortgage Co. from operating its broadcasting station (WMBB-WOK) in Chicago on a frequency of 1,190 kilocycles with a power output of 5,000 watts.

The following questions are certified to the Supreme Court:

Question 1. Did a corporation which, prior to the enactment of the radio act of 1927, applied for and obtained successive licenses from the Secretary of Commerce authorizing such corporation to broadcast with a specified transmitter, and which acquired and owned the necessary apparatus, the building in which the apparatus was housed, and the land whereon the same was located, and continuously broadcast therewith to an audience interested in its radio programs, have or acquire thereby a property right within the meaning of the word "property" as used in the fifth amendment to the Constitution of the United States?

(a) In the continuance of broadcasting by such corporation as a business or occupation?

(b) In the continued use of such apparatus, building, and land for similar broadcasting purposes?

Question 2. Does a corporation, which, subsequent to the enactment of the radio act of 1927, expended substantial sums in replacing old apparatus with new after obtaining a construction permit from the Federal Radio Commission and thereafter used the new apparatus under licenses issued by the Federal Radio Commission and continuously broadcast therewith to an audience interested in its radio programs, have or acquire thereby a property right within the meaning of the word "property" as used in the fifth amendment to the Constitution of the United States?

(a) In the continuance of such broadcasting as a business or occupation?

(b) In the continued use of such apparatus, building, and land for similar broadcasting purposes?

Question 3. If by virtue of the answers to questions 1 and/or 2, it appears that such a corporation had or acquired such property rights, is such a corporation deprived of property without due process of law, or without just compensa-

tion contrary to the provisions of the fifth amendment to the Constitution of the United States by virtue of the waiver required by the joint resolution of Congress of December 8, 1926, or the waiver referred to in the last paragraph of section 5, or the condition required to be contained in all licenses of subparagraph (a) of section 11 of the radio act of 1927, as amended?

Question 4. If by virtue of the answers to questions 1 and/or 2, it appears that after February 23, 1927, such a corporation had or acquired such a property right, is the radio act of 1927, as amended, valid as against the claim that it authorizes or requires the Federal Radio Commission, in acting upon an application for renewal of license by said person, to deprive such person of such property without due process of law, in that the only standards provided by the act for the guidance of the commission in acting upon such applications are that of "public interest, convenience, or necessity" and that set forth in section 5 of the amendatory act of March 28, 1928, and in that the act fails to require that the commission, prior to proceeding to a hearing or decision on such application, shall specify in what respect it deems or has failed to find that the granting of such application would not serve public interest, convenience, or necessity, contrary to the provisions of the fifth amendment to the Constitution of the United States?

Question 5. If by virtue of the answers to questions 1 and/or 2, it appears that after February 23, 1927, such a corporation had or acquired such a property right, is the act of March 28, 1928, amending the radio act of 1927 (commonly known as the Davis amendment) valid as against the claim that it authorizes or requires the Federal Radio Commission, in acting upon an application for renewal of license to deprive such person of such property without due process of law or to take private property for public use without just compensation, contrary to the provisions of the fifth amendment to the Constitution of the United States?

Question 6. If by virtue of the answers to questions 1 and/or 2, it appears that after February 23, 1927, such a corporation had or acquired such a property right, is the radio act of 1927, as amended, valid as against the claim that it authorizes or requires the Federal Radio Commission in its actions on an application for renewal of license by a person such as is described in question 2 to take property for public use without just compensation, by denying such application, contrary to the provisions of the fifth amendment to the Constitution of the United States?

The case of *Clinton R. White v. George E. Q. Johnson*, which was filed in the United States District Court for the Northern District of Illinois, arose by reason of the attempt of Clinton R. White, the owner of radio station WCRW at Chicago, to compel the commission to renew his license to operate on 1,340 kilocycles, with 500 watts power. An interlocutory injunction was sought to enjoin the commission from enforcing the penal provisions of sections 32 and 33 of the radio act of 1927 against Mr. White, either for violation of the provisions of the act or for violation of the order of the commission. The court denied the application for injunction, and upon appeal to the circuit court of appeals for the seventh circuit the following questions were certified to the Supreme Court of the United States:

1. Did a person who, prior to the enactment of the radio act of 1927, applied for and was granted successive licenses by the Secretary of Commerce for the operation of a broadcasting station, and who owned and continuously operated such broadcasting station, whereby it developed a following of listeners and advertisers which constituted a going business, have or acquire thereby property in the continued operation of such station, with power appropriate to continue the operation of said business, within the meaning of the word "property" as used in the fifth amendment to the Constitution of the United States?

2. If the answer to question 1 is in the affirmative, is the joint resolution of Congress of December 8, 1926, valid as against the claim that, by virtue of the waiver it requires, it works a deprivation of such property without due process of law or a taking of private property for public use without just compensation?

3. If the answer to question 1 is in the affirmative, is the radio act of 1927, as amended, valid as against the claim that, by virtue of the waiver required in the last paragraph of section 5 and by virtue of the condition required to be contained in all licenses by subparagraph (a) of section 11, it works a deprivation of such property without due process of law or a taking of private property for public use without just compensation?

4. If the answer to question 1 is in the affirmative, is the radio act of 1927, as amended, valid as against the claim that it authorizes or requires the Federal Radio Commission, in its action on an application for renewal of license by a person such as is described in question 1, to take private property for public use without just compensation, either by denying such application or granting it on such terms as virtually to destroy a going broadcasting business of such person?

5. If the answer to question 1 is in the affirmative, is the radio act of 1927, as amended, valid as against the claim that it authorizes or requires the Federal Radio Commission, in acting upon an application for renewal of license by said person, to deprive such person of such property without due process of law, in that the only standards provided by the act for the guidance of the commission is acting upon such applications are that of "public interest, convenience, or necessity" and that set forth in section 5 of the amendatory act of March 28, 1928, and in that the act fails to require that the commission, prior to proceeding to a hearing or decision on such application, shall specify in what respect it deems or has failed to find that the granting of such application would not serve public interest, convenience, or necessity?

III. DEVELOPMENTS OF THE FISCAL YEAR

I. COURT DECISIONS

While the decisions rendered by the courts in cases wherein the commission was a party were not numerous, certain of these are destined to have a more or less permanent effect on the law of radio and are entitled to special consideration.

THE WGY CASES

The first and probably best-known decision of the court of appeals is that rendered in the case of General Electric Co. and the People of the State of New York *v.* Federal Radio Commission, usually called the WGY case and reported in 31 F. (2d) 630. In this case the commission had failed to renew the license of WGY in all particulars, and an appeal was taken on the theory that an application which was granted WGY in part constituted a refusal of which the court might take cognizance under section 6 of the radio act of 1927. The court of appeals upheld this contention by reviewing and revising the decision of the commission in an administrative rather than a judicial capacity. It refrained, however, from passing on any question of property rights, although the power of Congress to deal with the subject matter by appropriate legislation was specifically recognized.

A petition for a writ of certiorari was thereupon filed in the Supreme Court and was granted on October 14, 1929. However, at the time of oral argument in January, 1930, the Supreme Court indicated from the bench that it had no jurisdiction over the cause inasmuch as the court of appeals was the final authority under the then existing appellate provision. The court on May 19, 1930, rendered a written opinion in which it was clearly enunciated that

the court of appeals, under the radio act of 1927, is an administrative tribunal and the Supreme Court has no appellate jurisdiction to review its determinations on writ of certiorari.

THE TECHNICAL RADIO LABORATORY CASE

In the next case decided by the court of appeals, *Technical Radio Laboratory v. Federal Radio Commission* (36 F. (2d) 111), the question of property rights in the use of the ether was squarely presented to the court and it was held that "the authority of Congress to regulate radio communication as a species of interstate commerce necessarily implies the right of reasonable regulation to control in the public interest the number, location, and activities of the broadcasting stations of the country as an integral system, and such control must necessarily at times involve the right of reasonable restriction and protanto prohibition." On the question of the weight to be attached to the commission's decision the court declared that "the burden is upon appellant and this court should sustain the commission's findings of fact unless they are shown by the record to be manifestly against the evidence."

THE CARRELL CASE

The legislative power of the commission to make rules of general application, entailing limitation of private property rights was sustained in the case of *Carrell v. Federal Radio Commission* (36 F. (2) 117). The order from which the appeal was taken put an end to the licensing of all portable broadcasting stations. By declaring for its validity the court defined, within broad limits, the regulatory authority of the commission.

THE WNYC CASE

Constitutional questions, involving property rights and the due-process clause, were again raised and determined in the commission's favor in the case of *City of New York v. Federal Radio Commission* (36 F. (2d) 115). The court further held that in operating a municipal station the city of New York is acting not in its governmental capacity but in its corporate proprietary capacity, and, irrespective of whether its activity is governmental or merely corporate, it is subject to regulation by the commission. A petition for a writ of certiorari was filed with the Supreme Court and this was denied on the same theory as the court had already determined in the *WGY* case, *supra*.

THE CHICAGO CASES (WLS, WENR, AND WCBA)

The commission's practice under General Order No. 40 was very seriously contested in a group of cases decided together by the court of appeals, namely, *Great Lakes Broadcasting Company v. Federal Radio Commission*, *Wilbur Glenn Voliva v. Federal Radio Commission*, *Agricultural Broadcasting Company v. Federal Radio Commission* (37 F. (2d) 993). In none of the cases did the court examine

into the procedural difficulties but proceeded simply to consider in its administrative capacity the relative merits of the three stations involved. The result of the decision was to give one of the stations, Great Lakes Broadcasting Co., a little more operating time at the expense of station WLS, owned by the Agricultural Broadcasting Co. The commission's decision was otherwise upheld with respect to the other stations. The importance of this decision is further enhanced by the fact that it sustained the general reallocation of broadcasting stations effected November 11, 1928.

Shortly after the rendition of the court's opinion in the above case station WLS applied to the Supreme Court for a writ of certiorari to review the action of the court of appeals. but this was denied by the court in a memorandum decision. The same station thereupon filed a bill of complaint in the United States Court for the Northern District of Illinois, eastern division, seeking to restrain the Great Lakes Broadcasting Co. and the Federal Radio Commission from interfering with its operation on the theory that the validity of the order of the court of appeals may be collaterally attacked in a constitutional court exercising judicial functions. A motion to dismiss the case as to the defendant members of the Radio Commission, because of the court's lack of jurisdiction and failure to serve process upon the commissioners, has been filed; and it is expected that the cause will proceed, if at all, only as to the Great Lakes Broadcasting Co.

THE RICHMOND DEVELOPMENT CASE

In the case of *Richmond Development Corporation v. Federal Radio Commission* (35 F. (2d) 883), the court reversed the commission's decision denying an application for extension of a construction permit. The applicant had expended a substantial sum on construction of its station in reliance on the commission's action, and this to the court seemed to justify granting the application.

THE CHICAGO FEDERATION OF LABOR CASE

In the case of *Chicago Federation of Labor v. Federal Radio Commission* (decided May 5, 1930, and not yet officially reported) the court declared that meritorious stations should not be deprived of privileges merely to make room for another station inasmuch as such an attitude would greatly impair the cause of independent broadcasting. The additional question of the propriety of the commission's procedure in requiring an applicant to designate in its application a single frequency upon which it may be heard was determined in the commission's favor.

THE UNIVERSAL SERVICE WIRELESS CASE

In *Universal Service Wireless Company v. Federal Radio Commission* (41 F. (2d) 113) an appeal was taken from a decision of the commission denying an application for point-to-point press communication facilities on the ground that the frequencies set aside for press service had already been assigned to one public utility corporation to serve all the press agencies. The court was not called upon to

determine this question in its decision but rather decided the case on the procedural ground that the appeal did not come within the appellate provisions of section 16 of the radio act, and, therefore, it could not assume jurisdiction.

2. THE AMENDMENT TO SECTION 16

Although Public Law No. 494 was not approved by the President until July 1, 1930, it had passed both Houses of Congress prior to the end of the fiscal year and should be considered as one of the important legal developments of that period.

While this or similar amendments to the radio act of 1927 had from time to time been suggested by various parties and had been incorporated into various bills pending in Congress, the immediate necessity for such legislation was made apparent by the decision of the Supreme Court in the case of *Federal Radio Commission v. General Electric Co. et al.* (See p. 50, ante.)

3. ACTIVE COMPLAINT AND INVESTIGATION WORK IN CONJUNCTION WITH THE DEPARTMENT OF COMMERCE

The past year has shown a marked development in the attempt of the commission to curb illegal operation of radio stations. The legal division has been instrumental in building up a complaint section which is beginning to function in splendid shape and is having a wholesome effect upon all licensees. This has been made possible only through the reorganization and increase in the personnel of the division and through a very splendid cooperation on the part of the radio division of the Department of Commerce. The legal division is keeping an accurate check upon any and all violations by all stations of any of the provisions of the radio act and of the regulations of the commission. This check has included deviation from assigned frequencies, use of excess power, use of indecent and obscene language, and the like. The reports are sent in by the various supervisors' offices and are compiled by the commission. These matters are then brought to the attention of the commission in passing upon applications for renewal of licenses of the respective stations.

It is surprising to learn that over 100 stations have violated the act or commission regulations in some particular during the past six months' period. Most of these violations are immediately corrected by the station and those that continue to violate are refused a renewal of license and their applications set down for hearing. During the past license period, ending April 30, 1930, 16 stations were set for hearing and two stations were refused renewal of their licenses.

Another important work of the legal division has been the matter of checking unauthorized broadcasting stations. This information comes to the commission from various private sources and also from the supervisors of the radio division. This information is compiled by the commission and forwarded to the Department of Justice for prosecution. During the past year over 50 violations of this nature have been reported to the commission and 10 have been forwarded to the Department of Justice.

The first conviction under the radio act for operating a broadcasting station without a license was had in the United States District Court at St. Louis, Mo., and the defendant, William Fellowes, was found guilty of operating a broadcasting station without a license and sentenced to one year and a day in jail. He was later deported.

4. CODIFIED RULES OF PRACTICE AND PROCEDURE

While the commission has at various times since its organization enacted and promulgated various rules and regulations governing practice and procedure and attempts at codification have been made, it was not successful in achieving this result until June 25, 1930. The causes for this delay have been chiefly two in number. In the first place, the commission itself was not established in its present form upon a permanent basis until December 18, 1929, it being originally intended that it should act after a time as a purely appellant body. In the second place, there has been no precedent or analogy upon which to draw and the very nature of the commission's duties under the act made any such rules and regulations almost impossible of speedy enactment.

It is respectfully submitted that no board or commission under either Federal or State law passes on problems which directly affect such a large part of the entire public and that in no other field of litigation are the parties to the proceedings drawn from such widely separated geographical districts. It is not uncommon in the case of a hearing involving the designation of one of the regional or local channels to have residents of the Pacific and Atlantic coastal areas interested as parties as well as others who reside at intermediate points. Obviously any system of orderly procedure tends to work a hardship on the parties in certain cases, and in the case of the minor operator the cost of personally attending hearings every time that his interests might be affected is virtually prohibitive. On the other hand, orderly administration without orderly procedure is an impossibility. It was with this in mind that the commission adopted General Order No. 93 providing for a comprehensive set of rules and regulations governing practice and procedure before it. A sufficient number of copies have been printed to supply all persons having a legitimate interest therein, and these are available by request directed to the secretary of the commission. Copies have been mailed to all station licensees and others who are interested in cases set for hearing.

5. APPOINTMENT OF EXAMINERS

Although the radio act of 1927, as originally enacted, authorized the appointment of examiners, and the steady growth of commission business has made it increasingly apparent that the commission and the individual commissioners should be relieved of the duty of actually conducting hearings, no provision for examiners was made until the 25th day of June, 1930, when the commission created three new positions in the legal division, one chief examiner and two attorney examiners.

The duties of these examiners will be to conduct hearings in such cases as the commission directs. It is believed that by thus pro-

viding for the conduct of all but exceptional hearings by examiners under the regulations of General Order No. 93,⁵ the individual commissioners will be permitted to devote more time to other pressing business and the time of the commission will not be taken up by the consideration of cases until all irrelevant and immaterial matter has been eliminated, the issues to be decided have been reduced to the absolute minimum, and are presented for determination in a regular and orderly manner.

⁵ SEC. 4. *Taking of testimony and argument.*—In case of any formal hearing herein provided for, the testimony may be taken before a quorum of the commission, before less than a quorum of the commission, or before any examiner appointed by the commission in the discretion of the commission, as follows:

(a) In the event that the testimony is taken before the commission it may be followed by oral argument by the parties or by the filing of briefs, or both, at the discretion of the commission, and the case shall thereafter be decided by the commission on the basis of the testimony heard and the proceedings had.

(b) In the event that the testimony is taken before less than a quorum of the commission or before an examiner, the testimony, duly transcribed, shall be reported back to the commission by the person or persons conducting such hearing together with a written report containing recommendations as to the decision to be made thereon and the facts and grounds upon which such recommendation is based. A copy of such report shall be mailed by the commission to each party participating in the hearing, and such party or parties shall have the right, providing the same is exercised within a period of 15 days from the mailing of such report, to file exceptions to said report. Such exceptions shall point out with particularity the alleged error in said report and shall contain specific reference to the page or pages of the transcript of hearing or report referred to. In case any party filing an exception to a report desires oral argument thereon, he shall accompany the exceptions with a written request for such argument before a quorum of the commission and shall file therewith an affidavit stating that a copy of such exceptions and request for oral argument has been mailed to or served upon every other party participating in the hearing. Upon receipt of such request and affidavit, the commission may in its discretion fix a time for such oral argument to be held at its offices in Washington, D. C., and give adequate notice to all parties participating in the hearing, or it may consider and decide such matter without argument.

REPORT OF THE CHIEF ENGINEER

C. B. JOLLIFF

(Capt. Guy Hill served as acting chief engineer until March 1, 1930)

GENERAL

The Federal Radio Commission regulates the use of the entire radio frequency spectrum except that portion used by Government stations, and makes assignments to the various classes of radio stations. The following radio services have been established to which assignments have been made:

Broadcasting.

Fixed point-to-point.

Maritime.

Aviation.

Amateurs.

Police.

Fire.

Emergency communication for power companies.

Experimental visual broadcasting.

Experimental relay broadcasting.

General experimental.

Geophysical prospecting.

ORGANIZATION

By amendment to the radio act of 1927, signed by the President December 18, 1929, the commission was authorized to appoint a chief engineer and two assistant chief engineers. On March 1, 1930, Dr. C. B. Jolliffe was appointed chief engineer and on March 25, 1930, Mr. V. Ford Greaves was appointed assistant chief engineer. The second assistant chief engineer has not yet been appointed. On June 30, 1930, the personnel of the engineering division consisted of eight engineers and nine clerks.

The engineering division is divided into three sections—(a) broadcasting, (b) commercial communications, and (c) international and interdepartmental relations.

BROADCASTING

ALLOCATION OF FREQUENCIES

The basic plan of allocation of frequencies set up by General Order No. 40, which resulted in the reallocation of November 11, 1928, has been maintained. Minor changes in frequency assignments were made from time to time in order to improve local conditions. One major shift of frequencies was ordered by General Order No. 87.

It appeared to the commission that certain stations were suffering from and causing cross-talk interference to other stations on other channels, in some cases due to improvements which increased the efficiency of transmitters since the present allocation was put into effect.

The engineering division made a comprehensive study and research, covering a period of several months, and the consideration

of many hundreds of possible combinations. The frequency shift specified in General Order No. 87 was selected as the best average of those then considered. It showed a total net gain in the reduction of interference between stations, which would result in reduction of interference in large areas throughout the United States.

General Order No. 87 was adopted by the commission on April 7, 1930, and ordered effective at 3 a. m. on April 30, 1930. However, three of the owners of broadcasting stations which would be affected by the proposed shift obtained restraining orders from the courts preventing the commission from putting the shift into effect.

EQUITABLE DIVISION OF RADIO BROADCASTING FACILITIES WITHIN THE UNITED STATES

The Davis amendment to the radio act, approved March 28, 1928, required that the radio supervising authority of the United States " * * * shall as nearly as possible make and maintain an equal allocation of broadcasting licenses, of bands of frequency or wave lengths, of periods of time for operation, and of station power, to each of said (five) zones and shall make a fair and equitable allocation of licenses, wave lengths, time of operation and station power to each of the States * * * within each zone, according to population (of each State)."

The proportion of the maximum possible national broadcasting facilities due each State is, therefore, fixed by law. The percentages or number of units due each State were based upon official estimates of 1928 populations prepared by the United States Census Bureau, which will be used until the figures of the official 1930 census are available.

It is evident from a consideration of the estimated and variable factors and the different economic and geographic conditions in various parts of the United States that the quota allocation can never be exact. The ratio will vary from time to time as conditions are further improved by continued development of the radio art and decisions of the Federal Radio Commission.

General Order No. 40, adopted by the commission, August 20, 1928, is an outline basis for an equitable distribution of broadcasting facilities in accordance with the Davis amendment considering public interest, convenience, and necessity. As amended, it provided for a certain number of higher power stations on interference-free channels to serve rural and sparsely settled areas over long distances under favorable conditions. It also provided for a comparatively large number of smaller stations to serve State and city local areas.

It was necessary for the commission to determine the maximum number of stations of various powers which could operate simultaneously at night in the United States without objectionable interference, so that quota tables could be prepared showing the facilities assigned to each zone, and each State within a zone, for comparison with facilities due.

The following table was established in 1928:

- 40 night stations, each 5 kilowatts or more.
- 130 night stations, each 250 to 1,000 watts.
- 150 night stations, each 100 watts or less.

In accordance with this table, two or more stations dividing time on one assignment were considered as one station. ("Limited time stations" operating on clear channels and "day stations" were not charged to "quota.")

The "quota" system adopted in 1928 showed the number of full-time station assignments of each of the three classes due each State as compared to the number of full-time assignments licensed. These figures nearly all came out in fractions showing further the impossibility of an exact allocation among States based on population.

Under the 1928 system, if a State was "under quota" on one class of service and "over quota" on another class, it was not practicable to determine the total value of the three classes of assignments so that one could be balanced against another to determine if a State was actually "under or over quota" on total radio facilities.

Therefore, the development of a "unit system" was undertaken to evaluate stations, based on type of channel, power, hours of operation, and all other considerations required by law.

The result of this research was General Order, No. 92, specifying the "unit value" of stations of various types, powers, etc., including "limited time" and "day" stations as chargeable to "quota."

In order to calculate the number of units due each zone and each State in accordance with population, it was necessary to determine the number of channels of different classes and number of stations of various powers which could be used for simultaneous operation without objectionable interference, and calculate the unit values, taking into account the factors of the Davis amendment. Taking these into consideration, the commission on June 25, 1930, selected 400 units as fairly representing the total broadcasting facilities of the United States. This gives 80 units to be divided among the States in each zone.

A complete tabulation of the revised quota figures by zones and States follows, giving "units" due, based on estimated population of 1928 by the United States Census Bureau.

Detail of quota units by zones and States

Zone 1:	State	Total units due	Zone 2—Con.	State	Total units due
	Connecticut.....	4. 87		Pennsylvania.....	28. 03
	Delaware.....	. 71		Virginia.....	7. 33
	District of Columbia.....	1. 53		West Virginia.....	4. 90
	Maine.....	2. 33			
	Maryland.....	4. 73		Total.....	80. 00
	Massachusetts.....	12. 54	Zone 3:	Alabama.....	7. 33
	New Hampshire.....	1. 34		Arkansas.....	5. 54
	New Jersey.....	11. 18		Florida.....	4. 02
	New York.....	33. 77		Georgia.....	9. 12
	Rhode Island.....	2. 10		Louisiana.....	5. 55
	Vermont.....	1. 03		Mississippi.....	5. 10
	Porto Rico.....	3. 80		North Carolina.....	8. 37
	Virgin Islands.....	. 07		Oklahoma.....	6. 91
	Total.....	80. 00		South Carolina.....	5. 31
Zone 2:				Tennessee.....	7. 13
	Kentucky.....	7. 26		Texas.....	15. 62
	Michigan.....	13. 06		Total.....	80. 00
	Ohio.....	19. 42			

Zone 4:	State	Total units due	Zone 5:	State	Total units due
	Illinois.....	22. 08		Arizona.....	3. 37
	Indiana.....	9. 49		California.....	32. 34
	Iowa.....	7. 25		Colorado.....	7. 74
	Kansas.....	5. 48		Idaho.....	3. 88
	Minnesota.....	8. 13		Montana.....	3. 90
	Missouri.....	10. 52		Nevada.....	. 55
	Nebraska.....	4. 21		New Mexico.....	2. 81
	North Dakota.....	1. 92		Oregon.....	6. 41
	South Dakota.....	2. 10		Utah.....	3. 77
	Wisconsin.....	8. 82		Washington.....	11. 27
				Wyoming.....	1. 75
	Total.....	80. 00		Alaska.....	. 39
				Hawaii.....	1. 82
				Total.....	80. 00

Following is a table giving the total quota by zones and the total assignments as of June 30, 1930. The assignments vary from day to day by actions of the commission and because of surrender of licenses by stations for various reasons.

	Total units due	Total units assigned	Total units under or over quota
Zone 1.....	80. 00	74. 19	-5. 81
Zone 2.....	80. 00	69. 34	-10. 66
Zone 3.....	80. 00	89. 19	+9. 19
Zone 4.....	80. 00	96. 08	+16. 08
Zone 5.....	80. 00	93. 8	+13. 8
Totals.....	400. 00	422. 6	+22. 6

The United States was 22.6 units (5.6 per cent) over the maximum 400 as of June 30, 1930, averaging less than one-half unit per State. Twenty-six States were under quota as compared to 22 States over quota. This is a fair balance, considering the many technical complications and conflicting interests.

As pointed out, the distribution of radio facilities can never be exactly proportional, but it is evident that conditions will be gradually improved as some stations are deleted for one reason or another and other assignments are transferred from overquota to underquota areas.

TRANSMITTING EQUIPMENT

In the past there was no standard method adopted by the commission for rating the power of broadcasting stations, and several methods used by different stations did not agree. In order to standardize the method of rating, the commission adopted General Order, No. 91. This general order specifies the power rating of the equipment which may be installed in the various classes of stations and sets up standard methods of measuring the operating power of stations. By means of this order all stations are rated on the same basis. Since one of the factors in the allocation of broadcasting facilities is power, a standard method of measuring power is essential to a fair and equitable distribution.

SYNCHRONIZATION OF BROADCASTING STATIONS

Methods of piezo-electric control of the frequency of radio stations have improved and the accuracy of setting and maintaining the frequency of a transmitter to 1 part in 100,000 is not unusual. While this accuracy of control is sufficient to reduce the frequency of the beat note between two broadcasting stations operated on the same frequency to below audibility, it was found that a different type of interference appeared, usually referred to as "flutter interference." This interference results in a destruction of quality of the two stations when the frequency difference between the stations is a few cycles per second. Experiments showed, however, that if this difference in frequency could be reduced to less than one-tenth cycle per second the impairment of quality would be greatly reduced, provided both stations broadcast the same program and the geographical separation was within certain limits.

For example, equipment capable of maintaining this constancy was installed in two stations which were under the same control and carried the same programs. These stations are 190 miles apart and are licensed to use 5 kilowatts each. This equipment is the combination of good frequency control by each station with a manual control of the frequency at one of the stations. A receiving set placed halfway between the two stations indicates the difference in frequency. When the frequency difference was held to less than 0.1 cycle per second, the interference was confined to a relatively small area. The net result was that the two stations operating simultaneously on the same frequency and with the same program were able to double the good-service area of either station alone at the expense of a very small area. The commission granted authority to operate these two stations simultaneously on an experimental basis during broadcasting hours, and the results showed that there was a very small number of objections to such operation.

INTERNATIONAL AND INTERDEPARTMENTAL RELATIONS

INTERNATIONAL TECHNICAL CONSULTING COMMITTEE ON RADIO COMMUNICATIONS

The international radio convention signed at Washington, November 25, 1927, created the International Technical Consulting Committee on Radio Communications (C. C. I. R.) and charged the Netherlands Government with the duty of calling the first meeting. This meeting was held at The Hague, September 18 to October 2, 1929. The preparatory work of the United States for this conference was carried on by a joint conference of Government and commercial representatives, and a very complete document was sent to the Netherlands Government which formed the basis for much of the discussion at the conference. The United States delegation was headed by Maj. Gen. C. McK. Saltzman, of the Federal Radio Commission.

The conference formulated 26 recommendations which covered all phases of radio communications, but principally served to define the present state of the radio art.¹

¹ The report of this meeting was published by the State Department.

The Department of State on March 12, 1930, transmitted these recommendations to the Federal Radio Commission and made the following request:

* * * If there is no objection to the proposals adopted at the conference, the department will be glad to be advised whether the commission will put them into effect. If the commission has any objections to the proposals contained in the above-mentioned inclosures, you are requested to inform the department concerning them.

To this the commission replied:

* * * The Federal Radio Commission has no objection to the recommendations made by this conference and will put them into effect as soon as practically possible.

In addition to the recommendations the conference referred seven unfinished questions for study for the second meeting of the C. C. I. R. which is to be held in Copenhagen, Denmark, in 1931. The study of these questions was assumed by different nations; the United States agreed to centralize the study of two questions and to collaborate in the the study of the other five.

The Federal Radio Commission has assumed the responsibility for organizing the studies of the unfinished questions and the preparation for the next meeting of the C. C. I. R. An organization of representatives of commercial radio companies and Government departments was formed and active preparatory work started.

The International Radio Conference will meet in Madrid, Spain, in 1932. The preparatory work and the organization preparing for the next meeting of the C. C. I. R. will contribute to the preparatory work for the larger conference. International radio communications are important to the commercial relations of the United States and it is necessary, in order to protect the position of the United States, that complete preparation be made for all international radio conferences.

REGISTRATION OF FREQUENCIES USED IN INTERNATIONAL SERVICE

The international radio convention provides as follows for the notification of the use of radio frequencies:

Sec. 17. (1) Each administration shall promptly advise the international bureau when it decides upon, or authorizes, the establishment of a radio-communication station, the operation of which necessitates the assignment for its regular service of a particular frequency below 37.5 kilocycles (wave length above 8,000 meters) in the case where the use of this frequency might cause international interference over broad areas. This notice must reach the international bureau four months prior to the construction of the station contemplated in order to dispose of objections which any of the administrations might raise against the adoption of the proposed frequency.

(2) In the case of a fixed short-wave station intended to carry on regular service and the radiation of which would be likely to cause international interference, the administration concerned must, as a general rule, before the completion of the station and in any case before it is open for service, notify to the international bureau the frequency assigned to that station.

(3) Such notification, however, shall be sent only when the administration concerned shall have ascertained that the service in question can be established within a reasonable time.

The convention further provides a procedure for settling international disputes concerning interference between stations of different countries.

Up to the present time all cases of international interference have been settled by mutual agreement between operating agencies, since in every case it was possible to adjust the frequency of one of the stations and avoid interference. As the frequency spectrum becomes more and more congested the possibilities of changes in frequencies will be reduced, and cases may be expected to arise in the near future where changes are impossible, or, if made, would result in impairment of service. At that time it will be necessary to determine which station must discontinue use of the disputed frequency. The dates of the beginning of construction and inauguration of service will become of great importance. The notification of these dates to the International Bureau of the Telegraph Union at Berne, Switzerland, is official. Arrangements have been made to insure that these notifications are made regularly and that the publication of lists agree with the records of the commission.

INTERDEPARTMENTAL RELATIONS

The work of the commission must be coordinated with Government departments. Several departments are operating radio stations and are interested in assignments made to commercial stations which may affect their communications. Furthermore, the radio act of 1927 provides that the assignment of frequencies to Government departments shall be made by the President. The commission has cooperated with the Government departments in recommending assignment of frequencies, in the interdepartmental radio advisory committee, and by direct contact with the operating agency.

The development of commercial airways and the use of radio on aircraft have created many problems of mutual interest between the commission and the aeronautics branch, Department of Commerce. These problems have been considered and solved by representation on committees and attendance at conferences called by either of the two agencies. The licensing of transmitting stations and the control of communication facilities are the duties of the Federal Radio Commission.

INFORMAL AVIATION CONFERENCE BETWEEN REPRESENTATIVES OF CANADA AND OF THE UNITED STATES

A conference called by the Department of State of the United States at the suggestion of the Federal Radio Commission, in order to provide closer coordination between aviation radio in the United States and Canada, was held in New York on April 10, 1930, and was attended by three representatives of the Federal Radio Commission, as shown by the following list of delegates:

Representing Canada:

- Commander C. P. Edwards, director of radio telegraph branch, Department of Marine.
- Mr. G. C. W. Browne, chief inspector, radio telegraph branch, Department of Marine.
- Maj. W. A. Steel, royal Canadian signals, Department of National Defense.
- Capt. W. L. Laurie, royal Canadian signals, Department of National Defense.

Representing the United States:

Commissioner W. D. L. Starbuck, Federal Radio Commission.
 Col. Clarence M. Young, Assistant Secretary of Commerce for Aeronautics.
 Mr. W. R. Vallance, assistant to the solicitor, Department of State.
 Capt. F. C. Hingsburg, chief engineer, airways division, Department of Commerce.
 Dr. C. B. Jolliffe, chief engineer, Federal Radio Commission.
 Mr. Gerald C. Gross, engineer, Federal Radio Commission.

The following set of resolutions were adopted at this meeting as a result of the conference. Canada and the United States have both stated that these recommendations will be adopted:

INFORMAL CANADIAN-UNITED STATES AVIATION RADIO CONFERENCES

The coordination of airways communications and radio aids to air navigation in Canada and the United States is desirable, and the following principles are proposed as a guide in the operation of these systems.

The conference recommends that the two Governments study these principles and attempt to apply them to their respective systems, and that by correspondence and future conferences these principles be further developed and closer coordination obtained.

It is further recommended that:

1. The international air calling frequency 333 kilocycles be not required regionally for aircraft or aeronautical stations in Canada or the United States.
2. It be recognized that a frequency separation of 6 kilocycles is ordinarily sufficient between stations operating radio range beacon and radiotelephone services.
3. A minimum distance of 750 miles between radiobeacon stations operating on the same frequency is desirable. It is recommended that this separation be maintained between nations, although in some cases it may be necessary to reduce the separation within the interior of either country.
4. The following frequencies, 237, 240, 248, and 278 kilocycles out of the band 194-284 kilocycles, be reserved regionally for air services.
5. The following frequencies shall remain free from assignments in the United States within 750 miles of Canadian airways radio stations: 248, 290, 296, 326, and 332 kilocycles. In addition, no further assignments in the United States should be made on the following frequencies within 750 miles of Canadian airways radio stations: 240 and 314 kilocycles.
6. The following frequencies shall remain free from assignments in Canada within 750 miles of United States airways radio stations: 254, 260, 266, 272, 284, 302, 308, 320, 338, 344, and 350.
7. The frequency 278 kilocycles should be reserved primarily for low-power air-port use.
8. One frequency, approximately 237 kilocycles, shall be reserved for emergency messages from ground stations to aircraft in cases where such messages might interfere with the regular airways beacon service.
9. The following frequencies should be reserved for Canadian stations operating along the Canadian transcontinental airways from Halifax to Vancouver: 3,492 and 5,630 kilocycles.

The United States authorities will discuss with aviation companies operating between Chicago, Minneapolis, and St. Paul a change of frequencies from those now specified in the United States aviation plan for the green-chain to the red-chain frequencies in order that Canadian planes flying from Winnipeg to Minneapolis and St. Paul will be able to have closer frequency coordination.

10. The United States will continue to use 3,106 kilocycles as a national calling frequency and Canada will use the frequency 5,630 kilocycles for the same purpose, since the experience gained to date in the United States and Canada would indicate that the common calling frequency selected in the United States might not be equally suitable in Canada.

COMMERCIAL COMMUNICATIONS

FIXED SERVICES

Only minor changes have been made in assignments of frequencies to fixed services. Three orders of the Court of Appeals of the District of Columbia suspending acts of the commission have resulted in preventing the commission from making practically any changes in the frequency range of 1,500 to 23,000 kilocycles.

In order that the various communication companies might determine the best frequencies for use between the various points of their systems, the commission permitted any company to use any or all frequencies at any or all stations of the company. Sufficient time has elapsed to conclude such tests under actual traffic conditions; therefore, the commission announced that after December 31, 1930, only the exact frequencies for regular use shall be specified for each location.

The commission, by General Order No. 62, authorized the use of the center frequencies of the particular channels licensed to the various companies, and in addition provided for the use of mid-channels or adjacent frequencies of standard two-tenths per cent channels. This order was repealed and superseded by General Order No. 88.

Authorization to use transoceanic frequencies, i. e., frequencies above 6,000 kilocycles, for domestic communications on condition that no interference from such use will result to the services of any foreign country was granted to communication companies engaged in the transoceanic service.

The band of frequencies above 23,000 kilocycles was opened for commercial service to United States stations for the first time when permission was granted to the Mutual Telephone Co., which operates the telephone system of the Hawaiian Islands, to construct sixteen 150-watt transmitters for interisland public telephone service in the frequency band 34,000 to 54,000 kilocycles. Experimental tests of this service carried on for a 6-month period prior to the granting of these permits proved that these frequencies are particularly well suited for short-range communication.

MARITIME

Experience of the past year indicated that the maritime mobile radio-frequency operating plan of May 10, 1929, was not entirely satisfactory for present-day requirements. This was brought about principally because of the inauguration of public telephone service between passenger vessels at sea and the shore, which necessitated the allocation to this service of additional frequencies free of radio-telegraph interference.

A conference was held, beginning January 14, 1930, for the purpose of considering the May 10, 1929, allocation, which was attended by representatives of commercial companies and Government engineers. As a result of the conference a committee was formed to assist the commission in the formulation of a new plan. The objectives of the work of the committee were:

(1) To make more efficient use of the frequency space by arranging shore and ship channels in groups so as to permit the greatest possible operating efficiency in conformity with the technical limitations.

(2) To provide for new services and expansion of old services, especially for ship and shore telephony and telegraphy.

(3) To provide for the elimination of interference between maritime services and aircraft services.

(4) To provide for the necessary technical relationship between telephone and telegraph channels on the same ship.

(5) To form the basis of a plan which might be submitted by the United States at the next international radio conference.

The committee recommended the following rules and operating practices as being essential to the accomplishment of the foregoing objectives.

1. In so far as practicable, the block system of allocation of channels should be applied not only to services but also to classes of stations.

2. The frequency separation should be based on that recommended by the conference of the C. C. I. R. at The Hague on October 2, 1929, to the effect that the standard channels should be separated by approximately one-tenth of 1 per cent.

3. Single channels should be assigned to land and fixed stations and more than one adjacent channel should be assigned to stations and types of emissions requiring such widths.

4. Between 1,500 and 23,000 kilocycles the standard channel separation in the mobile and in the fixed and mobile bands should be designated as indicated below:

Frequency (kilocycles)	Channel width (kilocycles)	Frequency (kilocycles)	Channel width (kilocycles)
1,500 to 3,000-----	4	11,000 to 15,500-----	15
3,000 to 6,000-----	5	15,500 to 20,500-----	20
6,000 to 11,000-----	10	20,500 to 23,000-----	25

5. The tolerances of the average wave actually transmitted as compared with the frequency of the nominal wave, should be as follows:

- (a) 10 to 550 kilocycles:
 - Fixed and land stations----- .01 per cent
 - Ships and aircraft during a transmission----- .5 per cent
- (b) 1,500 to 6,000 kilocycles:
 - Fixed and land stations at least 0.025 per cent, but preferably----- .02 per cent
 - Ships and aircraft during a transmission----- 5 kilocycles
- (c) 6,000 to 23,000 kilocycles:
 - Fixed stations----- .01 per cent
 - Land stations----- .02 per cent
 - Ships and aircraft during a transmission----- 5 kilocycles

6. The engineering requirements for percentage separation between ship and coastal telephone and telegraph assignments are approximately as follows:

- 2½ to 3 per cent separation between mobile telephone and coastal telephone;
- 3 to 4 per cent separation between mobile telephone and mobile telegraph;
- 3 per cent separation between mobile telephone and coastal telegraph;
- 3 per cent separation between coastal telephone and mobile telegraph;
- 1 per cent separation between coastal telegraph and mobile telegraph;
- 0.5 per cent separation between coastal telephone and coastal telegraph; and
- 0.4 per cent separation between mobile telegraph and mobile telegraph (duplex operation).

7. Ship telegraph frequencies should be grouped in the lower frequency end of each of the mobile-service bands and the ship telephone frequencies should be grouped in a higher frequency end of the band. The coastal telephone frequencies should be as nearly as possible midway between the ship telegraph and the ship telephone frequencies.

8. In the assignment of ship and coastal telephone frequencies for 2-way communication with specific coastal stations, such frequencies should be desig-

nated in pairs, and the assignment of actual channels under the plan should be in accordance with the lists which follow.

9. Ships should be licensed on all of the ship-working frequencies in each band. This can be done by specifying the limits of each ship band. In addition, all ship licenses should include a clause permitting ships to transmit on the individual working frequencies of coastal stations when directed to do so by a coastal station controlling the frequency, provided, however, that when a ship utilizes a coastal station's frequency the tolerances of its frequency emission shall not exceed the limits allowed the coastal station.

10. The service assignments as provided in the International Convention of Washington, 1927, and in the North American Radio Conference of Ottawa, 1929, should be maintained. The relative proportions of assignments of channels to each type of service should be those represented on the spectrum chart contained in the annual report of the Federal Radio Commission for 1929.

11. In so far as is practicable, the various assignments of frequencies to types of service should be in harmonic relation.

12. Consideration should be given to the possible future action of international conferences relative to the division of the "shared bands." In this consideration due weight should be given to the requirements of ship telephone services, and the relative position in the spectrum in which such services should be with respect to ship telegraph services and coastal telephone and telegraph assignments. Consideration should therefore be given to the engineering requirements for percentage separation between such assignments as indicated in paragraph 6 above.

13. Consideration should also be given to the possibilities of avoiding interference in the assignment of coastal station frequencies by utilizing geographical separation.

14. In the utilization of coastal station working frequencies, consideration should be given to the interference to be expected from similar foreign stations. In this connection, it is entirely possible that each of the various regions of the earth may be able to make use of all the frequencies available for assignment to coastal stations, by reason of the fact that this is an intermittent service and it has been the practice in the past.

15. The Government authorities should take steps to prepare plans which incorporate the principles set forth herein and which should be presented as a basis of United States proposals at future international conferences.

16. The present assignments to stations in the bands, 100-195 and 390-485 kilocycles are working satisfactorily except for the fact that in a few individual cases there is need for improvement. It is therefore felt that if changes are necessary to secure improvement, the Federal Radio Commission should make use of the additional frequencies for coastal stations in the band 160-194 kilocycles.

17. It is considered impracticable in the low-frequency portion of the spectrum to assign stations in the same area 1 kilocycle apart.

18. In the assignment of low-frequency coastal and ship frequencies, the informal European agreement of November, 1927, should be maintained. If any European frequencies are to be duplicated in the United States, this must be done in such a way as not to cause interference with the service of the European stations.

19. The agreement made with Canada relative to the use of frequencies in the band, 390-485 kilocycles should be maintained.

20. In the assignment of low frequencies for coastal stations, attention should be given to the reduction of interference with the Canadian stations, and possibly an arrangement with Canada should be negotiated.

21. Before adopting finally the new specific channels in the band, 1,500 to 6,000 kilocycles, the matter should be accomplished in cooperation with other North American nations.

The commission has not yet adopted the recommendations or designated specific channels for use by the various companies for the reason that a large number of the proposed channels are in the mobile and fixed service bands, and such frequencies will not be available for allocation until the litigation now in the Court of Appeals of the District of Columbia is disposed of.

EMERGENCY SERVICES

Police.—A new operating plan for police-radio service was established. The general policies were adopted in General Order No. 85. Emergency police service may be granted to any municipally controlled station, and the allotted power range is from 50 to 500 watts according to the latest population figures published by the Bureau of the Census. Eight channels were set aside for the exclusive use of police service, and each channel is assigned on a shared basis to all cities in the same general area.

It is believed that the plan of employing a common channel in a specific area will lend itself to the accomplishment of a more efficient service, for the reason that all squad cars or other mobile units in the area will receive all of the emergency messages originating from any municipality in that general area, and thus coordinate the police activities in adjacent cities.

In order to facilitate the handling of State police radio communications, the commission granted a special license to the State of Michigan. Massachusetts and Pennsylvania are the only other States which are using radio for State police communication with mobile units, the former employing the same frequency assigned to Michigan and the latter a radiotelegraph service on a low frequency (257 kilocycles).

Fire.—The frequency 1,596 kilocycles was designated for emergency communication with fire boats. All requests to establish this service were granted.

The commission did not consider that there is sufficient justification for the establishment of emergency communication with mobile fire-department units on land or between fixed stations of municipal fire departments. Such service can best be rendered by coordination with police departments using radio or by wire communication.

Power companies.—Emergency radio service for power companies is a service providing for emergency radio communication between power-company stations when all forms of wire communication fail. The frequency 3,184 kilocycles with maximum power of 500 watts, continuous wave emission, was designated for this service. The policy adopted by the commission regarding the use of radio by such stations was set forth in General Order No. 86.

EXPERIMENTAL SERVICES

Relay broadcasting.—Much progress was made in the technical aspects of relay broadcasting, and as a consequence increased demands were made upon the Federal Radio Commission for the allocation of frequencies in the bands set aside for that purpose. The quarterly reports required from the stations operating in the relay broadcasting bands by General Orders No. 64 and No. 68 were used as a guide to indicate whether or not full use was being made of all the frequencies allocated, and this information has been useful in the determination of recommendations for the renewal of such licenses. The large number of applicants for the very small number of channels available requires that these channels be put to the maximum use.

Frequencies set aside for relay broadcasting were assigned to stations only if the broadcasting was destined for foreign countries and arrangements were made for reception in those countries.

Visual broadcasting.—"Visual broadcasting" includes the broadcasting of both television and pictures, which are intended to be received by the public. Point-to-point picture transmission, such as facsimile or telephotography, are not included with visual broadcasting.

Four frequency bands, each 100 kilocycles wide, were set aside for visual broadcasting by General Order No. 74, viz, 2,000-2,100, 2,100-2,200, 2,750-2,850, and 2,850-2,950 kilocycles. In addition, the channel 2,200-2,300 kilocycles is designated for experimental visual broadcasting on condition that no interference is caused to the radio services of any other nation on the North American Continent and in the West Indies.

The commission did not recognize visual broadcasting as having developed to the point where it has real entertainment value. Therefore, all licenses were issued on an experimental basis, and licensees are required to submit quarterly reports covering the experimental development of this service. Frequency assignments were made only as the result of hearing and based on the fact that the applicant was a qualified experimenter and could be expected to contribute to the advancement of the art.

General experimental.—The commission set aside the following frequencies for the use of qualified experimenters who desire to conduct radio research work: 1,604, 2,398, 3,256, 4,795, 6,425, 8,650, 12,850, and 17,300 kilocycles. Reports of work carried on show that the use of frequencies for this use resulted in many advances in the art of radio transmission.

In addition to the eight frequencies listed above, assignments of certain frequencies above 23,000 kilocycles for experimental work were also made. Assignment of frequencies other than those listed for experimental work were made only for limited periods and for experiments which by their nature could not be done on the frequencies above. In order to protect the regularly established commercial communications from interference, use of such frequencies was limited to such time as not to produce interference.

GEOPHYSICAL STATIONS

On March 10, 1930, the commission adopted the policy that the following frequencies set aside by General Order No. 74 for portable stations would be made available for all responsible applicants for geophysical exploration purposes: 1,600, 1,652, 1,664, 1,680, and 1,704 kilocycles. The maximum power assigned was 10 watts, except in cases where it could be shown by the applicant that exceptional conditions prevail, in which case a power not exceeding 50 watts was assigned.

Geophysical prospecting for oil has been very extensive and dependable, and radio communication is necessary in practically every method used. Radio is used for transmission of timing signals, operation of automatic devices, and communication between parties.

RADIO COMMUNICATIONS IN ALASKA

The Signal Corps of the United States Army has the task of assuring reliable communication between the United States and Alaska and within Alaska by means of the Signal Corps radio network. The commission has not authorized commercial stations in Alaska on a competitive basis with the Army. This provision eliminated all commercial radio circuits between the United States and Alaska and placed intra-Alaska communications under the supervision of the Army.

As a result of an intensive study of a commercial situation of Alaska, with the cooperation and collaboration of Signal Corps officials who have had direct supervision of radio communications in Alaska in the past, the commission adopted General Order No. 79, which set forth a definite licensing policy whereby the commercial operation of stations fitted in with the Signal Corps plan.

Under these provisions of this general order, all applications for commercial radio stations in Alaska are submitted to the commission through the radio supervisor, Seattle, the officer in charge, Washington-Alaska Military Cable and Telegraph System, the Chief Signal Officer of the Army, and the radio division of the Department of Commerce. In this manner important alterations and pertinent recommendations can be made on the application, so that the commission may be assured in passing on the application that the proposed station is properly licensed in accordance with the foregoing considerations.

Under the plan, long-distance communication within Alaska and messages destined to or from points outside of Alaska are routed through the Signal Corps collecting stations. Short-range communication with stations in the same vicinity and messages between ship and shore are handled direct between commercial stations.

AVIATION RADIO

The use of radio on aircraft has materially contributed toward the safety of aircraft in flight. The air-transport companies realized this fact, and several voluntarily equipped all aircraft with radio receiving sets to make use of the radio aids provided by the Department of Commerce. Many of these companies have also installed equipment for carrying on 2-way communications between aircraft and ground. Satisfactory transmitting and receiving sets specially designed for use on aircraft have been made commercially available.

It was evident that the limited number of suitable frequencies available for aviation was not sufficient to meet the demands of all the operating companies without coordination and cooperation. A conference of representatives of air-transport companies and interested Government departments was called by the commission. As a result of this conference a plan for the use of frequencies along established airways was adopted September 9, 1929. After further study and trials several amendments were made, and on June 26, 1930, General Order No. 94 was adopted, which made minor revisions to the plan and incorporated all amendments to the original plan.

Section 2 of General Order No. 94 provides for the cooperative use of frequencies by several air-transport companies. In order to coordinate more closely their radio activities and to assure dependable and adequate communications the air-transport companies formed a cooperative communications company for the aviation public and known as Aeronautical Radio (Inc.). Practically all companies which are operating radio-equipped aircraft are members.

