



FEDERAL COMMUNICATIONS COMMISSION



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Survey*

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FEDERAL COMMUNICATIONS COMMISSION



Headquarters: New Post Office Building, Washington, D. C.

Personnel as of January 1st, 1941

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THE TECHNICAL PROGRESS OF RADIO IN 1940

By

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THE year 1940 is particularly significant in the history of the broadcasting art due to the several major advances in technical phases of broadcasting and their application to the service of the public. In the standard broadcast service the ratification by all parties of the North American Regional Broadcasting Agreement, which provides for an orderly allocation of broadcast facilities between the North American countries, was the most important development. An increase in the number of stations authorized from 814 on January 1 to 882 on December 31, and a large increase in the number of directional antennas utilized by standard broadcast stations were the results of extensive technical planning of great importance to the industry. A high frequency broadcast service (FM broadcasting) which has been under development for a number of years made its advent as a service to the public employing wide band frequency modulation. Television, having been in the laboratory as the major developmental problem of the industry for some time, emerged with promise of a limited service to the public. The international broadcast service witnessed the advent of new rules which required increased transmitter power and the use of efficient directional arrays to concentrate the available energy in the desired direction and provide a more reliable service conveying American good will and better understanding to other portions of the world.

North American Regional Agreement

By far the most important development to effect the standard broadcast during 1940 was the ratification by Mexico on March 29 of the North American Regional Broadcasting Agreement, which made the Treaty valid. This Treaty is discussed in Mr. Gross' article, "A Review of International Affairs—1940," appearing in this RADIO ANNUAL. Although the Treaty would have been practically impossible of conclusion without the extensive use of directional arrays to provide mutual protection to the service of stations on shared channels, the number of such antennas increased rapidly during 1940 for reasons largely independent of the Treaty. These directional arrays make it possible to provide for a larger number of broadcast services without undue interference with existing services and in certain instances to concentrate service in desired densely populated areas. During the year the Federal Communications Commission issued 88 authorizations contemplating the installation of directional antennas at stations not so equipped previously, and on December 31, 1940, of the 882 broadcast stations in operation or authorized within the United States 186 were using or constructing directional radiating systems.

Last year there occurred the greatest increase in the use of directional radiating systems since the first such array was installed in 1932. There was also a greater increase in the number of standard broadcast stations than during any year since 1926.

New Standards of Good Engineering Practice

The application of the modifications in the Commission's rules and allocation practices incorporated in the new rules and the Standards of Good Engineering Practice, which became effective August 1, 1939, was responsible to a considerable extent for providing an increase in service of regional and local stations by permitting increases in night operating power and by permitting additional stations to be assigned to regional and local channels. The rules also provided for the operation of unlimited time secondary stations on certain of the clear channels. As most of these stations serve concentrated urban populations, all of these developments tended toward a greater preponderance of primary service and a larger choice of programs in the urban areas.

The demand for facilities, particularly in urban areas of the northeastern por-

tion of the United States, has exceeded the supply of such facilities even though an increase was provided by the change in the rules. At the end of the year the Commission had pending before it several proposals which involve the operation of unlimited time secondary stations on clear channels which were each reserved by the rules for the exclusive use of one high powered broadcast station designed to provide secondary rural service at night. Millions of isolated rural and small community listeners remote from primary broadcast service are dependent for their broadcast service on these secondary signals. These proposals to duplicate the clear channels, all involve a further concentration of primary broadcast services in the urban areas, at the expense of, in most cases, the present service or future improvement of service to the sparsely settled rural areas. There was a significant trend toward licensing of regional stations (Class III-B) in small remote urban centers, but so far as rendering primary service to all of the rural areas, the merest dent was made in such areas. This whole matter has been the subject of extensive study and such documents as the report of the committee of the Commission which held hearings during June, 1938, and the majority and minority opinions of the Commission in connection with the application of Station WHDH for unlimited time shed much light upon the matter.

Technical Developments

Several other developments took place in the technical phases of station operation, which, although not directly realized by the listener, are well worth mentioning. Manufacturers further perfected the low temperature quartz crystal for automatic frequency control which will enable stations to operate in better compliance with the Commission's amended requirement which requires that all transmitters be able to maintain their assigned frequency within plus or minus 20 cycles after January 1, 1942, and that all new equipment which was installed subsequent to January 1, 1940, shall be capable of maintaining this tolerance. While for years the frequency maintenance of broadcast stations has been so good that no station even changed position on your dial (except due to defects in the receiver), the new frequency reduces interference that would otherwise result between stations on the same channel. Accompanying the improvements in auto-

matic frequency control were improved frequency monitors for checking station operating frequencies as required by the rules. Inverse feed back or degenerative feed back was applied to a greater extent to broadcast transmitting equipment and it saw the first general application to the speech amplifier equipment in studios. The net result is an overall improvement in frequency response and a material reduction in audio harmonic distortion. This all means better fidelity of the program for those listeners who have receiving sets that compare in fidelity to the present transmitters.

A development of real importance to the high powered stations which heretofore employed one or more water cooled tubes with the attendant service requirements of the water cooling system, pumps, et cetera, was the perfection of high powered air cooled transmitting tubes.

A large number of stations employing directional antennas have installed phase monitors which enable operating personnel to maintain the adjustment of an array with much greater accuracy than was previously possible before the advent of these instruments. A general improvement has been noted in the technical efficiency of antennas accomplished through the installation of better ground systems, higher antenna structures, and the trend toward narrow base towers.

High Frequency Broadcast Service

The Commission recognized the utility of a high frequency broadcast service employing wide band frequency modulation, and, as a result of a hearing held during March, 1940, adopted rules establishing a high frequency broadcast service which became effective June 22, 1940. These rules establish forty 200 kilocycle channels (five channels for non-commercial educational stations) for a high frequency broadcast service in the band of 42,000 to 50,000 kilocycles. The rules involve an entirely new technical concept of the service of broadcast stations in that the service of all stations in a particular community will be approximately the same in so far as both signal intensity and area to which service is provided is concerned. The concept of trade areas has been introduced in order to tailor the service of the stations to a center of the population and the area tributary socially and economically to that center of population. In other words, the Commission is endeavoring to inte-

grate the service provided by high frequency broadcast stations to fit the social and economic spheres of influence of the center of population in which the station is to be located. The fact that the service areas of all stations in a particular center of population will be practically co-extensive will eliminate from the elements of competition between such stations, many of the inequalities which exist between stations in the standard broadcast band by reason of large differences in coverage and signal intensity caused by differences in power, propagation, interference, et cetera.

The rules, however, provide for three general classes of high frequency broadcast stations to meet the requirements of three types of areas. Twenty-two channels were reserved for stations serving basic and limited trade areas with populations of more than 25,000 each. Six channels are allocated to stations with service areas containing less than 25,000 persons. Seven channels are allocated for the third class stations proposing to serve large rural areas of at least 15,000 square miles which cannot be conveniently provided with service by stations in limited or basic trade areas and to provide service under special circumstances to two or more limited or basic trade areas. This class of station is particularly effective where a high elevation above the surrounding area is available.

The technical requirements with respect to the equipment to be used by high frequency broadcast stations are such that the fidelity of transmission and potential reception, both as to distortion and frequency range, are well beyond the capabilities of any but the most expensive custom built broadcast receivers (none now available on the open market) to reproduce at the present time. Such operation will permit of and encourage the development and use of receiving equipment capable of the best fidelity of reproduction which the industry is capable of producing. Due to the sky wave propagation characteristics of the frequencies utilized by the high frequency broadcast stations, there will be no difference in the area which can be served during daytime or nighttime hours such as now exists with standard broadcast stations.

The use of wide band frequency modulation will permit of the operation of stations with lesser mileage separations than would be possible with amplitude

modulation. This means many stations can be assigned the same channel.

Several manufacturers now make transmitters for the high frequency broadcast service which became available during the year. Shortly before the conclusion of the year the Commission held a conference in Washington for the purpose of standardizing the ratings and characteristics of the transmitting equipment for this new service.

On December 31, 1940, construction permits had been issued for 25 high frequency broadcast stations and the Commission had approximately 50 additional applications pending at the close of the year. That is, during the year 1940 all of the necessary steps from laboratory development to actual delivery of programs of a new adjunct to the radio service as an instrument of public benefit was an accomplished fact. Thus, the number of broadcast stations may be increased substantially, but unfortunately the service will not be principally to large rural areas and all existing receiving sets must have an expensive adaptor (\$49.95 for a popular model) added to obtain the new service.

Television

Television, long heralded as the next important contribution of the radio industry to the technological society of today, encountered rather a stormy year. This problem child of broadcasting was at its best during 1940! Although it was much closer to being an established fact as a service to the public at the close of the year than on January 1, 1940, there are still problems to be encountered. As a result of extensive field tests made by several of the radio groups which have been engaged in the technical development a television, a committee of the Commission was appointed to investigate the service and coordinate the results of the field tests and the regulatory duty of the Commission. Their report proposed rules tentatively adopted by the Commission on December 22, 1939, permitting the introduction of a television broadcast service to the public on a limited commercial basis and providing for further research and development. The development would extend to both the technical phases of the art and the very important problems of program building. A hearing on these rules was held in Washington during January, 1940, and as a result thereof the Commission adopted rules providing for two classes of television

broadcast stations, one of which would provide a program service for public consumption with provision for the licensee to be reimbursed (if there be a sponsor) for program expenses by commercial advertisers.

As a result of promotional activity in receivers using certain standards which the Commission believed to be detrimental to the future technical advances in the television broadcast art, as well as possible rapid obsolescence of receivers purchased by the public, these rules were set aside and a further hearing held on April 8, 1940. This hearing developed a detailed study of the question of engineering standards and the effect of television systems upon receivers, transmitters, present acceptance of television, obsolescence, and technical progress. The Commission then adopted rules embodying the principles arrived at pursuant to the April hearing (abolished the two classes of stations, eliminated limited commercial operation, restricted programming and intensified research on standards). As a result of the requirements for intense research on standards, the National Television Standards Committee was formed and charged with making a detailed study of the problems of a standard system of television transmission which should be adopted for service to the public. At the conclusion of the year it was anticipated that the report of this committee would be available during January 1941.

A significant development in the art of television has been the intricate work of the National Television Standards Committee. Also, a significant but complicating angle has been added by the development and demonstration by the Columbia Broadcasting System of a practical color television system. This system makes possible the reproduction within the home of a color picture having a very satisfactory range of colors throughout the visible spectrum and providing what appears to be greater detail in the reproduced picture than that possible with the conventional black and white system employing shades of gray to represent different colors and to provide contrast between obstacles being televised. This apparent improvement is possible without any accompanying increase in the frequency band required

for the transmission of such pictures. The problem of sufficient light with color and the actual (but not apparent) loss of detail in the 6 megacycle channel are worthy of study. Certainly the value of color in television must not be sidetracked or lost.

In order to provide sufficient television channels to partially satisfy the demand for such facilities that was indicated at the hearings and by the applications filed with the Commission, it has been necessary to utilize the 6 mc channels above 160 mc. The limitation upon the amount of radio frequency power which could be generated by known methods at these frequencies was such that there was considerable hesitation on the part of the industry in accepting these high frequency television channels as being of value at this time. Consequently, the development during 1940 of transmitting tubes which make possible the generation of radio frequency power in sufficient amounts and with such efficiency that television or other transmission is possible outside of the laboratory is another significant advance.

Other developments include portable television pickup equipment carried in suitcase size units, the development of a new pickup tube having greater sensitivity than any previously available, and the electron microscope which is an offshoot of television development.

International Broadcast Service

International broadcast service during 1940 was affected mostly by technological changes intended to improve the signals provided by the stations in the foreign countries to which the services are directed. This improves the competitive position of these signals as compared to the services provided international broadcast stations in other countries. This effort has been directed particularly to the countries of South and Central America with which the United States is vitally concerned in the creation of good will from the standpoint of neighborliness, commerce, and national defense. The new rules require the use of not less than 50 kilowatts power and directional transmitting arrays to concentrate the energy in the desired directions so as to give the equivalent service of 500 kilowatts. This makes our stations in a

position to compete favorably (in many cases better) in signal intensity than other countries. In the promotion of good will and understanding between the countries of the Western Hemisphere through the use of radio, the United States relies upon international broadcast stations operated by private organizations. These stations carry programs originated expressly for the international broadcast service or obtained from selected programs from domestic service. During the year an increased amount of stress was placed by the operating groups upon the preparation of unique programs designed for general and wholesome appeal to the listeners in the country to which the signals were directed. The manner in which the international broadcast service is conducted may have an important bearing upon the friendly relations between the American countries in the future.

Relay Stations

The year 1940 saw an increase to over 500 in the number of relay broadcast stations used for program pickup in the absence of wire lines and for mobile use to cover parades, athletic contests and other special events which are unique in their requirements. At the close of the year there was considerable interest in a new service employing frequency modulation to provide a high fidelity audio program link (to supersede wire lines of less fidelity) between studio and transmitter.

Facsimile

Interest which had been evidenced on the part of the licensees of the number of standard broadcast stations having special experimental authorizations for facsimile and the licensees of facsimile broadcast stations appears to have waned considerably and at the end of 1940 there was little activity in connection with a facsimile broadcast service to the public. The rules governing the high frequency broadcast service (FM) provide for the multiplex facsimile signals with the high

frequency broadcast program providing the maximum frequency swing of plus and minus 75 kilocycles is maintained for the audio signal. However, there appeared to be certain technical problems with respect to this multiplex operation, particularly as concerned with the possibility of cross modulation (interference) between the facsimile and aural programs in receivers designed to accept not more than a 150 kilocycle band and without regard to the future multiplex facsimile. These matters will have to be made the subject of laboratory and field investigation before a solution of this problem can be reached, but unless this problem is properly taken care of in the receiver design now, "it is later than you think" for multiplex facsimile.

Developmental Broadcast Stations

The licensees of developmental broadcast stations continue to use them in connection with the design of new equipment and improvement of existing transmitting equipment. One licensee of a new developmental broadcasting station is conducting experiments in connection with a "polyphase" system of broadcasting. This involves the use of a five element array and modulation of the signal is accomplished by placing the carrier on the center element and side bands on the four surrounding elements. This system offers possible economies in both equipment and power consumption, particularly for powers well above 50 kilowatts.

For the first time developmental broadcast authorizations were issued to recognized engineers for use in site surveys, thus eliminating the requirement that the broadcast licensee obtain special experimental authorization to conduct site surveys and permitting site surveys where necessity requires prior to the granting of an authorization for a standard broadcast station.

Our prediction is that 1941 will be a continuation of 1940 without abatement as to continued technical progress in broadcasting.



BROADCAST APPLICATION PROCEDURE

A summary of the procedure in applying for a station in the broadcast services as followed by the Federal Communications Commission

Any person, firm, corporation, educational, or other group legally qualified may apply to the Federal Communications Commission for radio-broadcast facilities in any locality. Formal application for a standard broadcast station construction permit is submitted in duplicate direct to the Commission on Form 301, which is obtainable on request. Applicants for FM (frequency modulation) stations use Form 319, which applies to high-frequency broadcast stations.

Time Requirements

Each construction permit must specify a maximum of 60 days from date of grant thereof as the time within which construction of the station shall begin, and a maximum of 6 months thereafter as the time within which construction shall be completed and the station ready for operation, unless otherwise determined by the Commission upon proper showing in any particular case.

The time required for an application for a new broadcast station to go through the necessary routine varies with individual cases. In the case of a purely local station, where no interference is involved, the time can be as short as 4 to 6 weeks, providing that the application is accurately and completely filled out and all the required exhibits are appended. However, where interference and formal objection by other stations enter, a longer time is necessary.

Where the Commission, upon examination of a particular application, is unable to reach determination that a grant will serve the public interest, the case is designated for formal hearing upon specific issues, and all persons having an interest in the matter are given opportunity to be heard. Under present procedure, after a hearing has been held the parties are permitted 20 days in which to file supporting statements. The Commission then issues its Proposed Findings of Fact and Conclusions, and the parties are allowed 20 days thereafter to file exceptions and to request oral arguments before final decision is rendered. In the event that no exceptions or requests for oral argument are received, the Commission issues an order

adopting and making effective its proposed decision. This is the final determination unless there is litigation.

Equipment Tests

Upon completion of construction of a radio station the permittee is authorized to test the equipment for a period not to exceed 10 days. The inspector in charge of the district in which the station is located, as well as the Commission, are notified 2 days in advance of the beginning of equipment tests. When construction and equipment tests are completed, and after application for regular station operating license has been filed with the Commission (Form 302 for standard broadcast and Form 320 for high frequency broadcast) the permittee is authorized to conduct service or program tests for a period not to exceed 30 days, again advising the Commission and inspector in charge 2 days in advance of the beginning of such tests.

Broadcast stations are licensed for a period of 1 year. Requests for renewal of license are made on special forms.

The approximate cost of constructing a 100-watt standard broadcast station (the minimum power capable of rendering appreciable public service) is, roughly, between \$5,000 and \$8,500. High frequency (FM) stations cost somewhat more.

Public Interest Requirements

In the public interest, the Commission does not license stations to broadcast recordings exclusively.

Broadcast station licenses are denied corporations "of which any officer or director is an alien or of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives."

The Commission exacts no fee or other charge in connection with radio licensing. Unlike telephone and telegraph, a radio-broadcast station is not deemed a common carrier under the Communications Act. No standard tariffs apply. While certain specific prohibitions are imposed by the Act, the Commission is given no general censorship powers over broadcast programs.

— ADMINISTRATIVE — PROCEDURE OF F.C.C.

A summary of the administrative procedure of the Federal Communication Commission reviewing its duties and activities, the administrative setup, departments and their functions.

Commission

The Federal Communications Commission is composed of seven Commissioners appointed by the President, subject to Senate advice and confirmation. The President also designates the Chairman. The normal term of a Commissioner is seven years. A Commissioner is not permitted to engage in any other business during such tenure. Under terms of the creative act, "not more than four Commissioners shall be members of the same political party."

The Commission functions as a unit in administrative matters. It retains direct supervision of all activities but delegates certain routine responsibilities. Committees, consisting usually of three members, have made special studies and supervised particular undertakings. A case in point was the report last June by such a committee which investigated chain broadcasting methods. As a result of two years of inquiry, this committee rendered a 13,000-page report. The latter was based upon more than 10,000 pages of testimony and nearly 800 exhibits, obtained largely through hearings which continued for 73 days.

The Commission normally holds at least two en banc meetings each week. On Tuesdays it acts on various matters relating to radio, and telegraph and telephone. At such time the Commission considers—

Applications for construction permits for new stations or modifications of existing construction permits or licenses involving changes in frequency, power, transmitter and studio sites, or change in name of licensee.

Applications for voluntary or invol-

untary control of company or corporation holding license.

Petitions for rehearing.

Dismissal of applications.

Retiring of applications to closed files.

Adoption of new rules or amendments to existing rules.

Suspension of amateur or operator licenses.

Authority to supplement existing facilities or telephone or telegraph companies.

Extension of temporary authority to common carriers to communicate with foreign countries.

Other common carrier matters, such as investigation and suspension of tariffs.

Admissions to practice.

On Wednesdays the Commission acts on docket cases, that is to say, cases which have been accorded public hearings. Where the Commission, upon examination of a particular broadcast application, is unable to determine that a grant will serve the public interest, the case is designated for formal hearing upon specific issues, and all persons interested are given opportunity to be heard. After a hearing has been held, "Proposed Findings of Fact and Conclusions" are issued by the Commission. The parties are allowed additional time in which to file exceptions and to request oral argument before final decision is made. If no exceptions or requests for oral argument are received, the Commission generally issues an order adopting and making effective its proposed decision. If exceptions are filed, the Commission may, after oral argument, affirm,

modify, or reverse the proposed findings. This is the final determination unless there is a petition for rehearing or unless there is litigation.

Special Commission Board

Increased duties have caused the Commission to abandon its former practice of dispensing with en banc meetings for a month in summer. During vacation and at any time when a quorum of the Commission is not present the Commission continues to function under Administrative Order No. 3, effective last July, which contains these provisions:

"Whenever the Chairman or Acting Chairman of the Commission shall determine a quorum of the Commission is not present, he is authorized to place the following provisions in effect for the period during which a quorum of the Commission is not present:

"(1) There is hereby assigned and referred to a Board consisting of all members of the Commission present and able to act, all work, business, or functions of the Federal Communications Commission arising under the Communications Act of 1934, as amended, except that portion of the work, business, or functions of the Federal Communications Commission assigned and referred to the respective Boards and individual Commissioners as provided in Administrative Order No. 2, as amended; **Provided, however**, that this authority shall not extend to investigations instituted upon the Commission's own motion or, without consent of the parties thereto, to contested proceedings involving the taking of testimony at public hearings, or to investigations specifically required by the Communications Act of 1934, as amended.

"(2) The Board created by subparagraph (1) acting by a majority thereof, shall have power and authority to hear and determine, order, certify, report, or otherwise act as to any of said work, business, or functions so assigned or referred to it, and in respect thereof shall have all the jurisdiction and powers conferred by law upon the Commission, and be subject to the same duties and obligations. Any order, decision, or report made or other action taken by said Board in respect to any matters so assigned or referred shall have the same force and

effect, and may be made, evidence and enforced in the same manner as if made, or taken by the Commission.

"(3) Any party affected by any order, decision or report of said Board may file a petition for rehearing by the Commission, as provided by Section 1.271 of the Commission's Rules of Practice and Procedure, and every such petition shall be passed upon by the Commission."

Commissioners

In addition to en banc meetings, the Commissioners individually preside at particular hearings when designated to do so by the Commission. Each month the Commissioners, in rotation, are allocated other specific duties. These assignments are changed, thus permitting each Commissioner to be directly informed on various phases of Commission activity, at the same time conserving the principal portion of each Commissioner's time for consideration of matters involved in action by the Commission as a whole. In any month one Commissioner will act upon applications for requests for special temporary broadcast authorizations. Another will consider motions or petitions in cases designated for formal hearing, final disposition of which is, of course, reserved for the Commission as such.

Such authorization is covered by the following part of Administrative Order No. 2, which went into effect last year:

"A Commissioner, to be named by subsequent supplements to this Order, is hereby designated to hear and determine, order, certify, report or otherwise act upon:

(a) except as otherwise ordered by the Commission, all motions, petitions or matters in cases designated for formal hearing, including motions for further hearing, excepting motions and petitions requesting final disposition of a case on its merits, those having the nature of an appeal to the Commission, and those requesting change or modification of a final order made by the Commission; **provided**, however, that such matters shall be handled in accordance with the provisions of Sections 1.251 to 1.256, inclusive, of the Commission's Rules of Practice and Procedure; **provided further** that when one or more members of the Commission have been designated to preside at a hearing such

Commissioner or Commissioners shall be authorized and empowered to fix the time and place such hearing shall be held; and such motions, petitions, or matters arising in connection with such hearing shall be handled by the Commissioner or Commissioners designated to preside, subject to the provisions of Sections 1.232, 1.252, 1.254, 1.255, and 1.256 of the Rules of Practice and Procedure; **provided further** that in the absence of the individual Commissioner designated to preside at a hearing, or his inability to act or pass upon such preliminary matters, they shall be referred to the presiding officer of the Motions Docket.

(b) the designation pursuant to the provisions of Sections 1.231 to 1.232 of the Commission's Rules of Practice and Procedure of officers, other than Commissioners, to preside at hearings.

"Any party affected by any order, decision, or report of any individual, board, or individual Commissioner, to whom authority is delegated under the provisions hereof, may file a petition for rehearing, as provided by Section 1.271 of the Commission's Rules of Practice and Procedure, before the Commission, and every such petition shall be passed upon by the Commission."

Departments

In considering all types of cases the Commission is aided by recommendations of its technical and administrative units. The staff consists of four departments:

The Law Department handles litigation and the legal aspects of licensing, regulation, and general administration, including legislation, rule-making and international matters, and conduct of investigations.

The Engineering Department attends to the engineering phases of the various services, and their regulation, supervises the field staff, participates in international and governmental conferences, and conducts technical research.

The Accounting, Statistical, and Tariff Department looks after accounting regulation, tariff analysis and rate regulation, and compiles statistics pertaining to these and other Commission functions.

The Secretary's Office has charge of matters of internal administration, handles the issuance of licenses, maintains records, and is responsible for supply-

ing official copies of the Commission's order and decisions.

Rules Committee

The heads of these departments meet regularly, on Thursdays, as a Committee on Rules to consider proposals for new or revised rules and regulations, or changes in administrative procedure. This Committee can initiate such study or make comment or recommendation upon matters referred to it by the Commission. The Committee on Rules has functioned actively since 1937, and has done much to coordinate administrative procedure.

Administrative Board

In 1940 Commission work was further expedited by creation of an Administrative Board, consisting of the General Counsel, Chief Engineer, Chief Accountant, and Secretary. This board is authorized to pass upon routine detail in accordance with rules and policies previously established by the Commission. Administrative Order No. 2, as revised last July, gives the Administrative Board authority to "determine, order, certify, report or otherwise act upon" the following matters:

- "(a) All applications for the Coastal, Marine Relay, Aviation, Emergency and Miscellaneous services, except those falling under paragraphs (1), (2), and (3) of this Order;
- "(b) Upon all radio matters of every character (except broadcast, and cases falling under paragraphs (1), (2) and (3) of this Order) within the Territory of Alaska;
- "(c) Upon all applications for experimental authorizations except: Class II experimental stations to authorize experimentation directed toward the establishment of new services;
- "(d) Upon all broadcast service applications as follows: for licenses following construction which comply with the construction permit; applications for construction permit and modification of construction permit involving only a change in equipment; applications for extensions of time within which to commence and complete construction; applications to install frequency control equipment; applications relating to auxiliary equipment; ap-

lications for authority to determine operating power of broadcast stations by direct measurement of antenna power; applications for modification of licenses involving only change of the name of the licensee, where the ownership or control is not affected; applications for construction permit or modification of license involving relocation locally of a studio, control point or transmitter site not involving any substantial change in service area; applications for relay broadcast stations; and requests for authorization to rebroadcast under the provisions of Section 3.94 of the Rules and Regulations;

“(e) Upon all applications or requests for special temporary authorization other than those falling under paragraphs (1), (2), (3) or (5) of this Order;

“(f) All applications or requests for emergency and renewal exemptions from the provisions of Section 352 (b) of the Act;

“(g) Upon all uncontested proceedings involved in:

(1) the issuance of certificates of convenience and necessity and the authorization of temporary or emergency wire service, as provided in Section 214 of the Act;

(2) Applications for existing licensees for instruments of authorization for the Fixed Public or Fixed Public Press radio services, except applications involving (1) new points of communication, (2) changes in transmitter location other than local in character, (3) assignment of additional frequencies, or (4) involving change of policy by the Commission, or the establishment of a new type of service;

“(h) Upon requests for inspection of records under provisions of Section 1.5(c) of the Commission’s Rules of Practice and Procedure.”

Actions taken by the board are reported in writing each week to the Commission at its regular meeting. Applications or requests for special temporary standard broadcast authorizations are referred to the board for recommendation and reference to a Commissioner designated to act in such matters.

The same order which created this

board (Administrative Order No. 2) further speeded procedure by allowing the Secretary, Chief Engineer, and Chief Accountant to handle specific matters. Its particular provisions with respect to these officials follow:

Secretary

“The Secretary of the Commission is hereby designated to determine, order, certify, report or otherwise act, upon:

- (a) all applications for operator licenses or renewals thereof; and
- (b) all applications for amateur and ship stations or renewals thereof; and
- (c) all applications for aircraft station licenses or renewals thereof where the applicant is or has been the holder of a station license within the preceding year;

“The Secretary of the Commission is hereby designated to enter the appropriate final order of the Commission in all cases involving applications for radio station authorizations in which proposed findings and conclusions of the Commission have been issued pursuant to the provisions of Section 1.231 of the Commission’s Rules of Practice and Procedure and in which no exceptions have been filed within the time prescribed in said section.”

Chief Engineer

“The Chief Engineer of the Commission is hereby designated to determine and act upon all applications and requests and to make appropriate order in letter form for the signature of the Secretary of the Commission in the following matters:

- (a) temporary operation without specified items of equipment, or with temporary, substitute or auxiliary equipment;
 - (1) operation without an approved frequency monitor;
 - (2) operation without an approved modulation monitor;
 - (3) operation without thermometer in automatic temperature control chamber;
 - (4) operation without antenna ammeter, plate voltmeter or plate ammeter;
 - (5) operation with substitute ammeter, plate voltmeter or plate ammeter;
 - (6) operation without temporary antenna system;

- (7) operation with auxiliary transmitter as main transmitter;
- (b) operation with new or modified equipment pending repair of existing equipment, or pending receipt and action upon a formal application;
- (c) where formal application is not required, application for new or modified equipment or antenna system;
- (d) change of specifications for painting and lighting antenna towers where formal application is not required;
- (e) operation to determine power by direct method during program test period;
- (f) relocation of transmitter in same building;
- (g) operation with reduced power or time under Sections 3.57 and 3.71;
- (h) approval of types of equipment as to compliance with outstanding rules and standards;
- (i) all authorizations for equipment and program tests, or extensions thereof, where it appears that compliance has been had with the terms of the construction permit;
- (j) denial of requests for equipment and program tests where specifications of construction permit have not been met;
- (k) withdrawal of authorizations for equipment and program tests where subsequent to the issuance of the original authorizations it appears that the terms of the construction permit have not been met;
- (l) extensions of time within which to comply with technical requirements specified in authorizations, orders and rules or releases of the Commission;
- (m) representations of compliance with technical requirements specified in authorizations, orders, rules or releases (except formal applications);
- (n) operation with licensed, new or modified equipment at a temporary location with a temporary antenna system in case of an emergency when, due to causes beyond the control of the licensee, it becomes impossible to continue operating at the licensed location;
- (o) all authorizations for special operation necessary to facilitate

equipment, program and service tests or to comply with technical requirements specified in authorizations, orders, rules or releases.”

Chief Accountant

“The Chief Accountant of the Commission is hereby designated to determine, order, certify, report or otherwise act upon:

- (a) administration, interpretation and application of regulations promulgated by the Commission pursuant to Section 220 of the Act, relating to accounts, records, and memoranda to be kept by carriers subject to the jurisdiction of the Commission;
 - (b) applications for extensions of time in which to file annual, monthly, and special reports required by the Commission pursuant to Section 219 of the Act;
 - (c) administration, interpretation and application of orders or rules of practice and procedure promulgated by the Commission relating to financial and statistical data of standard broadcast stations and broadcast networks or chains, including applications for extensions of time in which to file financial and statistical statements and reports.
 - (d) all matters arising in connection with the administration of tariff regulations promulgated by the Commission pursuant to Section 203 of the Act, and in connection with the administration of this section in so far as it relates to the modification of requirements thereof or made pursuant thereto, as authorized in particular instances by subsection (b) thereof, and to the rejection of tariffs as authorized by subsection (d) thereof;
- and, where appropriate in carrying out the foregoing, to make orders in letter form for the signature of the Secretary of the Commission.”

Procedure

The procedure under which hearings are conducted and the administrative and adjudicative processes leading up to final decisions have been revised in the interests of public convenience as well as smoother Commission functioning. From the standpoint of internal administration,

these changes have vastly simplified and expedited the decision process. This speeding up has not been at the sacrifice of complete and deliberate consideration of every element of the various type of proceedings the Commission is called upon to decide. On the contrary, the standards of "fair play" in reaching administrative determinations, as laid down by the courts, have been fully met.

Some of the outstanding practice and procedure changes may be mentioned briefly. The Communications Act requires that the Commission grant radio authorizations without hearing if it is able to determine from the information before it that the authorization would serve public interest, convenience and necessity. Formerly such grants were made, in broadcast cases, subject to the right of interested parties to file protests within a 30-day period. The previous policy had been to require the holding of hearings in virtually all such cases, which frequently involved needless expense to the parties without disclosing information of a substantial character not already known to the Commission. Under present practice, when the Commission is satisfied from the information before it that a grant is warranted, it proceeds to authorize the issuance of the license, which grant is final rather than conditional in its terms. The rules fully protect the interests of persons other than the applicant by providing for the filing of petitions for reconsideration within a 20 day period.

Formerly it was the practice of the Commission to include in the issues upon which hearings were to be held, not only those matters on which the Commission entertained doubt, but issues which required affirmative proof of all items contained in the applications. As a result the task of preparation for hearings was rendered extremely burdensome, hearings were unnecessarily prolonged by the applicant's tedious proof of many facts not really in controversy. The Commission now undertakes the burden of determining and specifying limited issues in hearing cases, which are actually controversial in character and on which the results of the hearing must turn.

In yet another direction, the Commission has improved its practice in connection with the issues involved in hearings. It frequently happens that there are any one of several grounds on which it appears from initial examination of the application that a denial must result.

Some of these grounds would necessarily result in the introduction of a great deal of testimony and documentary evidence if included among the issues to be heard. In order to save time and money, both for the applicant and the Commission, effort is now made to eliminate issues which would unnecessarily complicate the hearing.

Under its former rules the Commission permitted any party to intervene if his petition disclosed a "substantial interest in the subject matter." Furthermore, the Commission designated as parties to its hearings those persons shown by its records to have some potential interest, whether or not such persons were known to have an intention to appear. The effects of the complete freedom of intervention and of the automatic inclusion of various persons as parties to the proceeding were the unnecessarily prolonged discussion of non-controversial issues and the unnecessary multiplication and accumulation of evidence on relevant issues, due to the cross examination to which witnesses were subjected by the various parties. The Commission's rules now require all parties who desire to appear in opposition to an application to file petitions to intervene, by means of which their interests may be tested, and parties are required to make a showing that the requested intervention will be in the public interest. The Commission also makes provision for the filing and consideration by any of the parties of motions for enlargement of the issues, a further safeguard for the protection of interests of applicants and other parties.

Motions Docket

In 1939 the Commission made provision or the holding of oral argument on all interlocutory motions, pleadings and matters of procedure which arise in cases pending before it. Previously, these motions were disposed of by the Commission without opportunity for argument, and thus without a full opportunity for parties in interest who might wish to oppose the relief sought to make a contest and have an adjudication based on a full showing of the nature of their interests. These interlocutory matters are now placed on a Motions Docket presided over by an individual Commissioner, which is called Friday of each week. Provision has also been made for the disposition in chambers of emergency motions, after proper notice to all parties.

F. C. C. REGULATIONS REGARDING BROADCASTING APPLICATIONS

As of January 1, 1941

PLACE of filing; number of copies. Each application for construction permit or station license, and all papers incorporated therein and made a part thereof, with respect to the number of copies and place of filing, shall be submitted as follows:

Two copies direct to Washington, D. C.

Contents. Each application shall be specific with regard to frequency or frequencies, power, hours of operation, equipment, location of the station, and other information required by the application forms. An application for broadcast facilities in the band 550 kilocycles to 1600 kilocycles shall be limited to one specific frequency. An application for radio station construction permit or license requesting alternate facilities will not be accepted.

Full disclosures. Each application shall contain full and complete disclosures with regard to the real party or parties in interest, and their legal, technical, financial and other qualifications, and as to all matters and things required to be disclosed by the application forms.

Additional statements. In addition the Commission may require an applicant to submit such documents and written statements of fact, under oath, as in its judgment may be necessary.

Installation or removal of apparatus. Applications for construction permit or modification thereof, involving removal of existing transmitting apparatus and/or installation of new transmitting apparatus, shall be filed at least sixty days prior to the contemplated removal and/or installation.

Extension of time for construction. Any application for extension of time within which to commence and/or complete construction of a station shall be filed at least thirty days prior to the expiration date of such permit: *Provided, however,* That any such application filed within less than thirty days may be accepted upon satisfactory showing to the Commission of sufficient reasons for the delay in filing such application. No application for reinstatement of a permit already forfeited will be granted, except

upon a satisfactory showing to the Commission of sufficient reasons for the delay in filing such application.

License following construction permit. In all cases where a construction permit is required by Section 319 of the Act for the construction of a station, the application for station license (or for station license or modification thereof, if for station other than broadcast) shall be filed by permittee prior to service or program tests.

Where construction permit not required. Each application for new license, except amateur, where a construction permit is not a prerequisite thereto, shall be filed at least sixty days prior to the contemplated operation of the station: *Provided, however,* That in emergency and for good cause shown, the Commission may waive the requirements of this rule.

Modification of license. An application for modification of license, except amateur, and except as otherwise provided by these rules, may be filed for change in frequency, change in operating power where no construction is necessary, change in hours of operation, and for change in name of licensee where no change in ownership or control is involved. In case of a broadcast station, an application for modification of license may be filed for change in location of main studio. In case of all stations other than broadcast, an application for modification of license may be filed for change in points of communication, change in nature of authorized service, and to cover an outstanding construction permit where the station is already licensed. Except when filed to cover construction permit, each application for modification of license shall be filed at least sixty days prior to the contemplated modification of license; *Provided, however,* that in emergencies and for good cause shown, the requirements hereof may be waived in so far as time for filing is concerned.

Renewal of license. Unless otherwise directed by the Commission, each application for renewal of license shall be filed at least sixty days prior to the expiration date of the license sought to be re-

newed. No application for renewal of license of a standard broadcast station will be considered unless there is on file with the Commission, the balance sheet and income statement currently required by the rules of practice and procedure of the Commission, reference to which by date and file number shall be included in the application.

Financial statements. Each licensee of a standard broadcast station shall file with the Commission on or before March 1 of each year on Forms 705 and 706, or such other forms as may be prescribed by the Commission, a balance sheet showing the financial condition of a licensee as of December 31 of the preceding year and an income statement for the preceding calendar year. Each such form shall be subscribed and verified by: (1) the parties or party filing the statement; (2) in the case of a corporation, an officer of the corporation. (An attorney for either is allowed with sufficient reason.)

Filing directed by Commission. Whenever the Commission regards an application for a renewal of license as essential to the proper conduct of a hearing or investigation, and specifically directs that it be filed by a certain date, such application shall be filed within the time thus specified. If the licensee fails to file such application within the prescribed time, the hearing or investigation shall proceed as if such renewal application had been received.

Temporary extension of station licenses. Where there is pending before the Commission any application, investigation, or proceeding which, after hearing might lead to or make necessary the modification of, revocation of, or the refusal to renew an existing license, the Commission may, in its discretion, grant a temporary extension of such license; *Provided, however,* That no such temporary extension shall be construed as a finding by the Commission that the operation of any radio station thereunder will serve public interest, convenience, and necessity beyond the express terms of such temporary extension of license; *And provided further,* That such temporary extension of license will in no wise affect or limit the action of the Commission with respect to any pending application or proceeding.

Assignment or transfer of control. (a) General. An application for consent to

assignment of a construction permit or license, or for consent to transfer of control of a corporation holding a construction permit or license, shall be filed with the Commission at least sixty days prior to the contemplated effective date of assignment or transfer of control. If the assignment or transfer is voluntary, the appropriate application shall be fully executed by all parties and, if involuntary, by assignee or transferee only.

(b) *Broadcast.* With each such application, involving any standard broadcast station construction permit or license, there shall be submitted under oath or affirmation all information required to be disclosed by the application forms prescribed by the Commission, together with such other information under oath or affirmation as the Commission may require.

(c) *Other than broadcast.* In all classes of applications for consent to assignment of construction permit or license or for consent to transfer of control of a corporation holding a construction permit or license, other than those prescribed in paragraph (b), the Commission may require the furnishing of such information as in its discretion is deemed necessary.

Special temporary authorizations. (a) Special temporary authority may be granted for the operation of a station for a limited time, or in a manner and to an extent or for service other or beyond that authorized in an existing license upon proper application therefor; *Provided, however,* That no such request will be considered unless:

1. It is received by the Commission at least ten days previous to the date of proposed operation: *Provided, however,* That any such request received within less than ten days may be accepted upon due showing of sufficient reasons for the delay in submitting such request.

2. Full particulars as to the purpose for which the request is made are stated.

(b) If the request is for operation of a standard broadcast station, the following additional requirements shall apply:

1. No such authority may be granted to a person other than the licensee of an existing standard broadcast station.

2. The request shall be limited to a definite or temporary period or periods

for the transmission of programs or events which are not recurrent, and approval thereof will not be granted for a period in excess of thirty days.

3. The request shall show that it has been seasonably submitted to other stations whose operations may be affected (to be determined as indicated below), and the date on which such request was so submitted, which such stations shall submit direct to the Commission waiver of objection to the granting thereof or a statement of the nature of any objections that such stations may desire to interpose:

4. If the request is for operation upon a clear channel, showing required above shall be made with respect to the Class I station or stations on the channel.

5. If the request is made by time sharing station, the showing required above shall be made with respect to the station or stations with which time is shared;

6. In any case, the showing required above must be made with respect to any station on the same or adjacent channels when any such station is located within the interference range of the station making the request to be determined by the "Standards of Good Engineering Practice Concerning Standard Broadcast Stations."

7. Waiver of objections, or statement of objections, when furnished under this rule, shall be forwarded direct to the Commission by the responding station, and in the case of waiver shall show whether the waiver covers simultaneous operation or whether the station is giving up the time sought by the applicant. Where it appears that the proposed operation has been seasonably submitted to the station or stations referred to in sub-paragraphs (4), (5), and (6), above, and no reply has been received, it will be considered that such stations have waived any objections to the granting of the request.

Special Service Authorizations. Special Service Authority may be issued to the licensee of a standard broadcast station for a service other or beyond that authorized in its existing license for a period not exceeding that of its existing license upon proper application therefor; and satisfactory showing in regard to the following, among others:

(a) That the requested operation may

not be granted on a regular basis under the existing rules governing the operation of standard broadcast stations;

(b) That experimental operation is not involved as provided for by Part 3, Section 3.22, of the Rules and Regulations;

(c) That public interest, convenience, and necessity will be served by granting the authorization requested.

Inconsistent or conflicting applications. When an applicant has an application pending and undecided, no other inconsistent or conflicting application filed by the same applicant, his successor or assignee, or on behalf or for the benefit of said applicant, will be accepted for consideration.

Multiple applications; broadcast service. In the broadcast service, while there is one application for new or additional facilities pending for a standard, international, television, facsimile, high frequency or experimental broadcast station, the Commission will not consider another application for new or additional facilities for a station of the same class (as given above) to serve in whole or in part the same area, by the same applicant or by his successor or assignee, or on behalf or for the benefit of the original parties in interest. Two such applications may not be filed simultaneously.

Repetitious applications. (a) *Broadcast services.* In the broadcast service, where an applicant has been afforded an opportunity to be heard with respect to a particular application for a new standard, international, television, facsimile, high frequency, or developmental broadcast station, or for an extension or enlargement of existing service or facilities, and the Commission has, after hearing or default, denied the application or dismissed it with prejudice, the Commission will not consider another application for a station of the same class (as given above) to serve in whole or in part the same area, by the same applicant or his successor or assignee, or on behalf of or for the benefit of the original parties in interest, until after the lapse of twelve months from the effective date of the Commission's order.

(b) *Other radio services.* In any other radio service, where an applicant has been afforded an opportunity to be heard with respect to a particular application for a new station, or for an extension or enlargement of service or facilities,

and the Commission has, after hearing or default, denied the application or dismissed it with prejudice, the Commission will not consider a like application involving service of the same kind to the same area by the same applicant, or by his successor or assignee, or on behalf of or for the benefit of the original parties in interest, until after the lapse of twelve months from the effective date of the Commission's order: Provided, however, That the Commission may waive the requirements of this rule in situations affecting safety of life or property.

Pending appeals. Where an appeal has been taken from the action of the Commission in denying a particular applicant another application for the same class of broadcast station and for the same area, in whole or in part, filed by the same applicant or by his successor or assignee, or on behalf or for the benefit of the original parties in interest, will not be considered until the final disposition of such appeal.

Action on Applications

Partial grants. Where any application is granted in part, or with any privileges, terms, or conditions other than those requested, without a hearing thereon, the action of the Commission shall be considered as granting such application unless the applicant shall, within twenty days from the date on which public announcement of such grant is made, or from its effective date if a later date is specified, 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. Upon receipt of such request, the Commission will vacate its original action upon the application and set the application for hearing in the same manner as other applications are set for hearing, and the applicant and other parties in interest will be notified thereof.

Designation for hearing. In cases where an application for radio facilities is proper upon its face but the Commission is unable to determine upon examination of the same that the granting of such application either in whole or in part, would serve public interest, convenience or necessity, the Commission will designate the same for hearing and the following procedure will govern it:

(a) The Secretary shall forthwith mail a written notice to the applicant setting

forth the action of the Commission designating the application for hearing, together with such statement of the Commission's reasons therefor as shall be appropriate to the nature of the application.

(b) In order to avail himself of the opportunity to be heard the applicant in person or by his attorney shall, within fifteen days of the mailing of the notice of designation for hearing by the Secretary, file with the Commission one additional copy of the application and all papers incorporated as a part thereof and a written appearance, stating that he will appear and present evidence on the issues specified in the statement of reasons furnished by the Commission on such date as may be fixed for the hearing.

Answers to Notices of Violation

Under Title III of the Act. Any licensee receiving official notice of a violation of the terms of the Communications Act of 1934, any legislative act, Executive Order, treaty to which the United States is a party, or the Rules and Regulations of the Federal Communications Commission, shall, within three days from such receipt, send a written answer direct to the Federal Communications Commission at Washington, D. C., and a copy thereof to the office of the Commission originating the official notice when the originating office is other than the office of the Commission in Washington, D. C.; *Provided, however,* That if an answer cannot be sent nor an acknowledgment made within such three-day period by reason of illness or other unavoidable circumstances, acknowledgment and answer shall be made at the earliest practicable date with a satisfactory explanation of the delay. The answer to each notice shall be complete in itself and shall not be abbreviated by reference to other communications or answers to other notices. If the notice relates to some violation that may be due to the physical or electrical characteristics of transmitting apparatus, the answer shall state fully what steps, if any, are taken to prevent future violations, and if any new apparatus is to be installed, the date such apparatus was ordered, the name of the manufacturer, and promised date of delivery. If the installation of such apparatus requires a construction permit, the file number of the application shall be given, or if a file number has not been assigned by the Commission, such identification as will

permit of ready reference. If the notice of violation relates to some lack of attention or improper operation of the transmitter, the name and license number of the operator in charge shall be given.

Revocation and Modification of Station Licenses

Revocation. Whenever the Commission shall institute a revocation proceeding against the holder of any radio station construction permit or license under Section 312 (a), it shall initiate said proceeding by serving upon said licensee an order of revocation effective not less than fifteen days after written notice thereof is given the licensee. The order of revocation shall contain a statement of the grounds and reasons for such proposed revocation and a notice of the licensee's right to be heard by filing with the Commission a written request for hearing within fifteen days after receipt of said order. Upon the filing of such written request for hearing by said licensee the order of revocation shall stand suspended and the Commission will set a time and place for hearing and shall give the licensee and other interested parties notice thereof. If no request for hearing on any order of revocation is made by the licensee against whom such an order is directed within the time hereinabove set forth, the order of revocation shall become final and effective, without further action of the Commission. When any order of revocation has become final, the person whose license has been revoked shall forthwith deliver the station license in question to the inspector in charge of the district in which the licensee resides.

Modification. (a) *Order to show cause.* Whenever the Commission shall determine that public interest, convenience, and necessity would be served, or any treaty ratified by the United States will be more fully complied with, by the modification of any radio station construction permit or license either for a limited time, or for the duration of the term thereof, it shall issue an order for such licensee to show cause why such construction permit or license should not be modified.

(b) *Contents of order to show cause.* Such order to show cause shall contain a statement of the grounds and reasons for such proposed modification, and shall specify wherein the said construction permit or license is required to be modified. It shall require the licensee against whom

it is directed, to be and appear at a place and time therein named, in no event to be less than thirty days from the date of receipt of the order to show cause why the proposed modification should not be made and the order of modification issued.

(c) *Failure to appear.* If the licensee against whom the order to show cause is directed does not appear at the time and place provided in said order, a final order of modification shall issue forthwith.

Suspension of Operator Licenses

Order of suspension. No order of suspension of any operator's license shall take effect until fifteen days' notice in writing thereof, stating the cause for the proposed suspension, has been given to the operator licensee who may make written application to the Commission at any time within said fifteen days for a hearing upon such order. The notice to the operator licensee shall not be effective until actually received by him, and from that time he shall have fifteen days in which to mail the said application. In the event that physical conditions prevent mailing of the application at the expiration of the fifteen-day period, the application shall then be mailed as soon as possible thereafter, accompanied by a satisfactory explanation of the delay. Upon receipt by the Commission of such application for hearing, said order of suspension shall be held in abeyance until the conclusion of the hearing which shall be conducted under such rules as the Commission, shall deem appropriate. Upon the conclusion of said hearing the Commission may affirm, modify, or revoke said order of suspension.

Proceedings. Proceedings for the suspension of an operator's license shall in all cases be initiated by the entry of an order of suspension. Respondent will be given notice thereof together with notice of his right to be heard and to contest the proceeding. The effective date of the suspension will not be specified in the original order but will be fixed by subsequent motion of the Commission in accordance with the conditions specified above. Notice of the effective date of suspension will be given respondent, who shall send his operator license to the office of the Commission in Washington, D. C., on or before the said effective date, or, if the effective date has passed at the time notice is received, the license shall be sent to the Commission forthwith.

DEVELOPMENTAL BROADCAST STATIONS

The term "developmental broadcast station" means a station licensed to carry on development and research for the advancement of broadcast services along lines other than those prescribed by other broadcast rules or a combination of closely related developments that can be better carried on under one license.

Licensee and Location	Call Letters	Frequency (kc)	Power	Emission
Bell Telephone Labs., Inc. Whippany, N. J.....	W3XDD	560, 900, 1340	50 kw	A3
Bell Telephone Labs., Inc. Whippany, N. J.....	W3XPY	43700, 44300	5000 w	Special
Central Broadcasting Co. Mitchellville, Iowa	W9XC	1000	1000 w	A3
The Crosley Corp. Near Mason, Ohio	W8XO	700	100 kw-500-kw	A3
Natl. Broadcasting Co., Inc. Area of New York, N. Y....	W10XF	1614, 2398, 3492.5, 4797.5, 6425, 9135, 12862.5, 17310, 23100, 30660, 31020, 31140, 31180, 31540, 33340, 33460, 33620, 35060, 35460, 37060, 37140, 37540, 39140, 39460, 39540, and va- rious frequencies be- tween 116050 and 161775, 162000-168000, 210000-216000, 264000-270000, 300000-400000, 401000 and above	25 w	A1, A-2, A3, A4, A5 & Spe- cial A5 on frequencies above 162000 kcs.
Natl. Broadcasting Co., Inc. Area of New York, N. Y....	W10XR	Same as above	100 w	A1, A2, A3, A4, A5 & Spc- cial A5 on frequencies above 162000 kcs.
University of Connecticut Storrs, Conn.	W1XCS	39540, 139960, 300000-400000 C.P. 26300, 139960, 300000-400000	250 w C.P. 1000 w	A3 & Special C.P. A3 & Special with multiplexed facsimile

INTERNATIONAL BROADCAST STATIONS IN THE UNITED STATES

The term "international broadcast station" means a station licensed for the transmission of broadcast programs for international public reception. (Frequencies for these stations are allocated from bands assigned, between 6,000 and 26,600 kilocycles, for broadcasting by International Agreement). Such stations, are required to render a broadcast service which will reflect the culture of this country and promote international goodwill.

Licensee and Location	Call Letters	Frequency (Kc)	Power
Columbia Broadcasting System, Inc. Near Wayne, N. J.	WCBX	6120, 6170, 9650, 11830, 15270, 17830, 21570	10 kw
C. P. Brentwood, N. Y.			C.P. 50 kw
Columbia Broadcasting System, Inc. Brentwood, N. Y.	WCRC	6060, 11830, 15270. 17830, 21520	50 kw
			(C.P. only)
The Crosley Corp. Mason, Ohio	WLWO	6080, 9590, 11710. 15250, 17800*, 21650 *conditional	50 kw
General Electric Company South Schenectady, N. Y.	WGEA	6190, 9550, 15330. 21500, 21590	25 kw
			C.P. 50 kw
General Electric Company South Schenectady, N. Y.	WGEO	6190, 9530, 15330	100 kw
General Electric Company San Francisco, Calif.			20 kw
	KGEI	6190, 9530, 15330 S.A. 9670	C.P. 50 kw
National Broadcasting Co., Inc. Bound Brook, N. J.	WRCA	9670, 21630 C.P. 9670, 17780	35 kw
			C.P. 50 kw
National Broadcasting Co., Inc. Bound Brook, N. J.	WNBI	6100, 17780 S.A. 11890 C.P. 6100, 21630	35 kw
			C.P. 50 kw
WCAU Broadcasting Company Newtown Square, Pa.	WCAB	6060, 15270, 21520, 25725	10 kw
Westinghouse Electric & Mfg. Co. Saxonburg, Pa.			40 kw
	WPIT	6140, 9570, 11870, 15210, 17780, 21540	C.P. 50 kw
C. P. Hull, Mass.			
World Wide Broadcasting Corp. Scituate, Mass.	WRUL	6040, 11730, 11790, 15130, 15350, 17750	20 kw
			C.P. 50 kw
World Wide Broadcasting Corp. Scituate, Mass.	WRUW	11730, 11790, 15130, 25600, 15350	20 kw
PENDING APPLICATION			
God's Bible School & College Cincinnati, Ohio	Unassigned	11710, 21610	60 kw