

FCC RULES & REGULATIONS FOR BROADCAST SERVICES

EXPLANATION

Rules and Regulations of the Federal Communications Commission governing broadcast services, are published herewith in full text, with certain exceptions. These have been corrected by the FCC Legal and Engineering staffs, to Jan. 10, 1946, and are published in cooperation with the FCC, whose valuable service is gratefully acknowledged. Standards of Good Engineering Practice Governing Standard Broadcast Stations and other portions of the Rules and Regulations not published herewith, are available through the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

THE RULES AND REGULATIONS OF THE FEDERAL COMMUNICATIONS COMMISSION ARE PUBLISHED IN SEPARATE PAMPHLETS NUMBERED AND TITLED AS FOLLOWS:

<p>Part</p> <ol style="list-style-type: none"> 1. Rules of Practice and Procedure. 2. General Rules and Regulations. 3. Standard and High-Frequency Broadcast Stations. 4. Broadcast Services Other Than Standard Broadcast. 5. Experimental Radio Services. 6. Fixed Public Radio Services. 7. Coastal and Marine Relay Services. 8. Ship Service. 9. Aviation Services. 10. Emergency Radio Services. 11. Miscellaneous Radio Services. 12. Amateur Radio: Stations and Operators. 13. Commercial Radio Operators. 14. Radio Stations in Alaska Other Than Amateur and Broadcast. 15. All Radio Stations in the War Emergency Radio Service. 31-32. Uniform System of Accounts, Class A and Class B Telephone Companies, and Units of Property, Class A and Class B Telephone Companies. 	<p>Part</p> <ol style="list-style-type: none"> 33. Uniform System of Accounts for Class C Telephone Companies. 34. Uniform System of Accounts for Radiotelegraph Carriers. 35. Uniform System of Accounts for Wire-Telegraph and Ocean-Cable Carriers. 41. Telegraph and Telephone Franks. 42. Preservation of Records. 43. Reports (Filing of Information, Contracts, Periodic Reports, etc.). 51. Classification of Telephone Employees.* 52. Classification of Wire-Telegraph Employees. 61. Tariffs. 62. Applications to Hold Interlocking Directorates. 63. Extension of Lines and Discontinuance of Service by Carriers. 65. Communications Fellowships for Students from Other American Republics.
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* Rules of Interstate Commerce Commission dated July 1, 1917, are still in effect—not reprinted by Federal Communications Commission.

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ADMINISTRATIVE PROVISIONS

§1.1 *Offices; hours.*—The principal office of the Commission shall be located at Washington, D. C., and all communications to it shall be addressed to the Secretary, Washington, D. C., unless otherwise specifically directed. The hours of the Commission are from 9:15 a.m. to 5:45 p.m., Monday through Friday, except on legal holidays.

§1.2 *Meetings.*—All meetings of the Commission, unless otherwise determined by a majority of the members thereof, shall be held at the principal office of the Commission.

§1.3 *Minutes.*—The minutes of a meeting of the Commission shall be the official record of any action taken therein, and shall be kept by, and in the office of, the secretary.

§1.4 *Authentication of documents.*—All orders, permits, licenses, or other instruments of authorization made, issued, or granted by the Commission, shall, unless otherwise specifically provided by order of the Commission, be signed by the secretary in the name of the Commission and authenticated by the seal of the Commission.

§1.5 *Inspection of records.*—Subject to the provisions of section 4 (j), 213 (f), 412 and 606 of the act, the files of the Commission shall be open to public inspection as follows:

(a) Tariff schedules required to be filed under section 203 of the act;

valuation reports, including exhibits filed in connection therewith, unless otherwise ordered by the Commission, with reasons therefor, pursuant to section 213 of the act; and annual and monthly reports required to be filed under Section 219 of the act.

(b) Contracts, agreements, or arrangements between carriers, filed pursuant to section 211 (a) of the act, except such contracts relating to foreign wire or radio communications which are marked confidential by the Commission; *Provided, however,* The Commission will give appropriate consideration to a petition filed by any party showing that any such contract, agreement, or arrangement relates to foreign wire or radio communication; that its publication would place American communication companies at a disadvantage in meeting the competition of foreign communication companies; and that public interest would be served by keeping its terms confidential.

(c) All applications and amendments thereto filed under Title II and Title III of the act, including all documents and exhibits filed with and made a part thereof, and all communications protesting or endorsing any such applications; authorizations and certifications, issued upon such applications; all pleadings, depositions, exhibits, transcripts of testimony, reports of examiners or presiding officers, exceptions, briefs, proposed reports, or findings of fact and conclusions; all minutes and orders of the Commission. The information filed under §1.301 and network and transcription contracts filed pursuant to §1.302 shall not be open to public inspection. The Commission may, however, either on its own motion, or on motion of an applicant, permittee or licensee, for good cause shown designate any of the material in this subsection, as confidential.

(d) In the discretion of the Commission, other files, including those excepted in paragraphs (a), (b) and (c) hereof, upon written request describing in detail the documents to be inspected and the reasons therefor.

§1.6 *Certified copies; requests for; costs.*—Copies of any documents subject to inspection under the provisions of section 1.5 will be prepared and certified by the secretary, under seal, on written request, specifying the exact documents, the number of copies desired, and the date on which the same will be required: *Provided, however,* That such request must be made so as to permit a reasonable time for the preparation of such copies: *And provided further,* That any cost incurred in the preparation of such copies shall be prepaid by the person making application therefor.

§1.7 *Official reporter; transcript.*—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 will be furnished by the Commission, but will be open to inspection under section 1.5. Such transcript, if desired, must be obtained from the official reporter upon payment of the charges therefor.

§1.8 *Person, defined.*—Wherever in these rules the term "person" is used, it shall include an individual, partnership, association, joint-stock company, trust, or corporation.

§1.9 *Computation of time.*—In computing any period of time prescribed or allowed by these rules, by order of the Commission, or by any applicable statute, the day of the act, event, or default after which the designated period of time begins to run is not to be included. The last day of the period so computed is to be included, unless it is a Sunday or a legal holiday, in which event the period runs until the end of the next day which is neither a Sunday nor a holiday. When the period of time prescribed or allowed is less than 7 days, intermediate Sundays and holidays shall be excluded in the computation. A half holiday shall be considered as other days and not as a holiday.

§1.10 *Additional time to parties in certain cases.*—Where, under these rules, unless otherwise expressly provided, any limitation is made as to the time within which any document is required to be filed, or any procedural step is required to be taken in connection with any hearing, parties who are residents of Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, and California shall have an additional period of 5 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: *Provided, however,* That this rule shall not apply to any limitation as to time fixed by statute.

§1.11 *Documents in foreign languages.*—Every document, exhibit, or other paper written in a language other than English, which shall be filed in any proceeding before the Commission or in response to any order of the Commission unless expressly waived therein, shall be filed in the language in which it is written together with an English translation thereof duly verified under oath to be a true translation. Each copy of every such document, exhibit, or other paper filed, shall be accompanied by a separate copy of the translation.

§1.21 *Suspension, amendment, etc., of rules.*—The rules and regulations of the Commission may be suspended, revoked, modified, amended, or supplemented, in whole or in part, at any time by the Commission.

PERSONAL APPEARANCES; PRACTITIONERS

§1.31 *Appearances.*—Any individual, receiver, or trustee may appear and be heard in person or by attorney. A partnership may appear and be represented by any member thereof or by attorney. A corporation, association, joint-stock company, or trust, may appear only by attorney.

§1.32 *Authority for representation.*—Any person, in a representative capacity, transacting business with the Commission, may be required to show his authority to act in such capacity.

§1.33 *Persons who may be admitted to practice.*—Attorneys at law admitted to practice before any court of the United States, the District of Columbia, or the highest court of any State or Territory, upon application may be admitted to practice before the Commission. An attorney at law from any place other than the District of Columbia may, in the discretion of the Commission or the official presiding at any hearing, be admitted for a particular case in which he may be employed.

§1.34 *Applications for admission.*—Applications for admission to practice shall be on a form prescribed and provided by the Commission. (See appendix No. 1.)

§1.35 *Oath.*—No person shall be admitted to practice before the Commission until he shall have subscribed to an oath or affirmation that he will de-

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mean himself as a practitioner before the Commission, uprightly and according to law; and that he will support the Constitution and laws of the United States and will conform to the Rules and Regulations of the Commission.

§1.36 Suspension; disbarment.—The Commission may censure, suspend, disbar, or revoke the right of any person who has been admitted to practice before it if it finds that such person has violated his oath taken upon admission; or has, in obtaining admission, concealed any material facts with reference to his legal qualifications, professional standing, character, or integrity, or has failed to conform to recognized standards of professional conduct: *Provided, however,* That before any member of the bar of this Commission shall be censured, suspended, disbarred, or his right to practice before the Commission revoked, charges shall be preferred by the Commission against such practitioner and he shall be afforded an opportunity to be heard thereon.

§1.37 Register of practitioners.—A register will be maintained by the Commission in which will be entered the names of all persons entitled to practice before the Commission. Only individuals will be admitted or recognized.

§1.38 Former employees.—(a) No member, officer, or employee of the Commission shall, within 2 years after his service with the Commission is terminated, appear as attorney before the Commission in any cause or application which he has handled or passed upon while in the service of the Commission.

(b) No member, officer or employee of the Commission (1) whose active service with the Commission has terminated but who is receiving pay while on annual leave not taken prior to separation from such active service, or (2) who is in any other leave status, shall appear as attorney or participate in the preparation or handling of any matter before, or to be submitted to, the Commission.

§1.39 Appearance blanks.—Each attorney representing a party to any proceeding shall enter his appearance, in duplicate, on the form prescribed for the purpose by the Commission prior to participating in such proceeding, which appearance shall be made a part of the record. (See appendix No. 2.)

PARTIES

§1.51 Parties, defined.—The term "party" shall include any person, body politic, municipal organization, or State Commission. Parties to proceedings will be designated as applicants, complainants, defendants, petitioners, interveners, protestants, or respondents.

§1.52 Applicant.—The term "applicant" means a party applying for a certificate, certification, permit, license, or such other instrument of authorization as the Commission is empowered to grant, and for which an application is required.

§1.53 Complainant.—The term "complainant" means a party who complains to the Commission of anything done or omitted to be done by any common carrier subject to the act in violation of the provisions thereof.

§1.54 Intervener.—The term "intervener" means a party who, upon petition, has been permitted to become a party to any proceeding before the Commission.

§1.55 Protestant.—The term "protestant" means a party opposing the schedules under suspension in investigation and suspension proceedings, or a party who files a protest to a tentative valuation in valuation proceedings.

§1.56 Petitioner.—The term "petitioner" means a party other than as defined above seeking relief within the jurisdiction of the Commission.

§1.57 Defendant.—The term "defendant" means a common carrier subject to the act against whom a complaint has been filed of anything done or omitted to be done in violation of the provisions of the act.

§1.58 Respondent.—The term "respondent" means a party against whom the Commission has, on its own motion, instituted an inquiry, investigation, revocation, suspension, modification, cancellation, or other proceeding.

§1.59 Receiver or trustee of carrier.—The receiver or trustee of any common carrier subject to the act shall be made a party to any proceeding in which such carrier is a party.

§1.60 Substitution of parties.—The Commission in a proper case may order a substitution of parties; in case of death of a party, upon suggestion thereof; and in other circumstances, for good cause shown, upon petition.

APPLICATIONS AND AMENDMENTS—GENERAL

§1.71 Applications made on prescribed forms; exceptions.—Each application for an instrument of authorization shall comply with the Commission's rules and regulations and shall be made in writing, subscribed and verified as provided in section 1.121 on a form furnished by or in the manner prescribed by the Commission: *Provided, however,* That in emergency cases the Commission may waive the requirements of formal application with respect to applications for other than radio licenses and for licenses, renewals, or modification thereof for stations on vessels or aircraft of the United States, pursuant to section 308 (a) of the act. Separate application shall be filed for each instrument of authorization requested: *Provided, however,* That in cases arising in services other than broadcast where a single licensee holds a number of licenses which are identical in their terms or which are identical in their terms with the exception of station locality, and in other cases in the discretion of the Commission, a single application may be filed for renewal or modification of such licenses, where such single application sets forth in detail and in unmistakable language, an accurate description of the individual licenses sought to be renewed or modified. The required forms may be obtained from the Commission or from any of its field offices. (For a list of such offices and related geographical districts, see appendix No. 3.)

§1.72 Defective applications.—(a) Applications which are defective with respect to completeness of answers to required questions, execution, or other matters of a purely formal character will not be received for filing by the Commission unless the Commission shall otherwise direct.

(b) If an applicant is requested by the Commission to file any documents or information not included in the prescribed application form, a failure to comply with such request will constitute a defect in the application.

(c) Applications which are not in accordance with the Commission's rules, regulations or other requirements will be considered defective unless accompanied either (1) by a petition in accordance with section 1.81 to amend any rule or regulation with which the application is in conflict, or (2) by a request of the applicant for waiver of, or an exception to, any rule, regulation or re-

quirement with which the application is in conflict. Such request shall show the nature of the waiver or exception desired and set forth the reasons in support thereof.

(d) Defective applications will not be considered by the Commission.

§1.73 Amendments and dismissals; when allowed.—Any application may be amended or dismissed without prejudice as a matter of right prior to the designation of such application for hearing. Thereafter, requests to amend or dismiss without prejudice will be considered only upon written motion served upon all parties of record as provided in section 1.141.

When leave to amend has been granted after an application has been designated for hearing, the application will not be removed from the hearing docket unless the Motions Commissioner shall determine that the proposed amendment substantially affects the issues upon which the application has been designated for hearing and orders that the application shall be removed from the hearing docket. An amended application which has been removed from the hearing docket will be reexamined by the Commission and when necessary will be redesignated for hearing at a subsequent time.

§1.74 Form of amendments.—Any amendment to an application shall be subscribed, verified, and submitted in the same manner, and with the same number of copies, as was the original application.

§1.75 Amendments ordered.—The Commission may, upon its own motion or upon motion of any party to the proceeding, order the applicant to amend his application so as to make the same more definite and certain.

§1.76 Withdrawal of papers.—The granting of a request to dismiss or withdraw an application or a pleading does not authorize the removal of such application or pleading from the Commission's records. No application or other document once officially filed shall be returned unless the Commission shall, for good cause shown, order such return.

§1.77 Failure to prosecute applications not designated for hearing.—The following provisions shall apply to applications which have not been designated for hearing. An applicant not desiring to prosecute his application may request the dismissal of same without prejudice. A request of an applicant for the return of an application which has been officially filed will be considered as a request to dismiss the same without prejudice. Any application which has not been designated for hearing and which by reason of failure to respond to official correspondence or otherwise is subject to dismissal for non-prosecution will be dismissed without prejudice.

AMENDMENTS OF RULES

§1.81 Requests for amendment of rules.—Any person may petition for amendment of any rule or regulation. Such petition shall show the desired change in the rules and regulations and set forth the reasons in support thereof.

AMENDMENTS TO PLEADINGS

§1.91 Time for filing; disposition.—Any pleading may be amended as a matter of right if filed with the Commission not less than 30 days prior to the date set for hearing in the proceeding in which the pleading is filed. Thereafter, requests for leave to amend will be considered only upon written motion. Amendments, amended pleadings, or requests for leave to amend must be served upon all parties of record as provided in section 1.141 prior to filing. Amendments to applications may be determined only as provided in section 1.73.

PETITIONS AND COMPLAINTS

§1.101 General.—Petitions for relief under the jurisdiction of the Commission shall set forth clearly and concisely the petitioner's interest and the facts supporting the relief sought. (See also sections 1.72 (c) and 1.81.)

§1.102 Intervention.—Petitions for intervention must set forth the grounds of the proposed intervention, the position and interest of the petitioner in the proceeding, the facts on which the petitioner bases his claim that his intervention will be in the public interest, and must be subscribed or verified in accordance with section 1.122. The granting of a petition to intervene shall have the effect of permitting intervention before the Commission but shall not be considered as any recognition of any legal or equitable right or interest in the proceeding. The granting of such petition shall not have the effect of changing or enlarging the issues which shall be those specified in the Commission's notice of hearing unless on motion the Commission shall amend the same.

§1.103 Complaints.—Communications to the Commission complaining of anything done, or omitted to be done, in contravention of the provisions of the act, except formal and informal complaints filed under "Special provisions relating to common carriers" hereof, may, in the discretion of the Commission, be investigated or otherwise acted upon in any manner the Commission may deem expedient; but such communications shall not be deemed to be either formal or informal complaints within the meaning of these rules, irrespective of any action taken thereon by the Commission.

SUBSCRIPTION AND VERIFICATION

§1.121 Applications; amendments.—Each application or amendment thereto shall be personally subscribed and verified: (1) By the party filing such application or amendment, or by one of the parties, if there be more than one; (2) by an officer of the party filing the application or amendment if the party be a corporation: *Provided, however,* That subscription and verification may be made by the attorney for the party (1) in case of physical disability of the party, or (2) his absence from the continental United States. If it be made by a person other than the party, he must set forth in the verification the grounds of his belief as to all matters not stated upon his knowledge and the reason why it is not made by the party.

§1.122 Pleadings.—All pleadings (not including applications or amendments thereto) filed by any party represented by an attorney, shall be signed by at least one attorney of record in his individual name, whose address shall be stated. A party who is not represented by an attorney shall sign and verify

¹ For specific rules regarding petitions to intervene in connection with applications under Title III, see section 1.387.

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his pleading and state his address. Except when otherwise specifically provided by rule or statute, pleadings signed by the attorney for a party need not be verified or accompanied by affidavit. The signature of an attorney constitutes a certificate by him that he has read the pleading; that to the best of his knowledge, information, and belief there is good ground to support it; and that it is not interposed for delay. If a pleading is not signed or is signed with intent to defeat the purpose of this section, it may be stricken as sham and false and the matter may proceed as though the pleading had not been served. For a willful violation of this rule an attorney may be subjected to appropriate disciplinary action. Similar action may be taken if scandalous or indecent matter is inserted.

SPECIFICATIONS AS TO DOCUMENTS AND PLEADINGS

§1.131 *Papers, general.*—All papers filed in any proceeding shall, unless otherwise specifically provided herein, be on paper 8½ by 13 or 14 inches, with left-hand margin not less than 1½ inches wide: *Provided*, That this requirement shall not apply to original documents, or admissible copies thereof, offered as exhibits: *And provided further*, That specially prepared exhibits may be submitted on paper of a width of 13 or 14 inches, of any length with a left-hand margin of 1½ inches on the 13- or 14-inch dimension. The impression shall be on one side of the paper only and shall be double-spaced, except that long quotations shall be single-spaced and indented. All papers, except charts and maps, shall be typewritten or prepared by mechanical processing methods, other than letter press or printed. The foregoing shall not apply to official publications. All copies must be clearly legible.

§1.132 *Briefs.*—Briefs may be printed, typewritten, mimeographed, or multi-graphed: *Provided, however*, That printed briefs shall be in 10- or 12-point type, on good unglazed paper, 5⅞ inches wide by 9 inches long, with inside margin not less than 1½ inches wide, and with double-led text and single-led citations.

SERVICE OF DOCUMENTS: COPIES

§1.141 *Service, proof of service.*—All pleadings, petitions, motions, or other documents (other than applications under title II, formal complaints, supplemental complaints, cross-complaints, and amended complaints) filed in any proceeding shall be served by the party filing the same upon all parties of record as follows:

Service upon common carriers shall be made as provided in section 413 of the Communications Act of 1934, as amended.

In all other cases whenever under these rules service is required or permitted to be made upon a party, and such party is represented by an attorney of record in the proceeding, the service shall be made upon the attorney. Service upon the attorney or upon a party shall be made by delivering a copy to him or by mailing it to him at his last-known address. Delivery of a copy within this rule means: handing it to the attorney or to the party; or leaving it at his office with his clerk or other person in charge thereof; or, if there is no one in charge, leaving it in a conspicuous place therein, or, if the office is closed or the person to be served has no office, leaving it at his dwelling house or usual place of abode with some person of suitable age and discretion then residing therein. Service by mail is complete upon mailing.

Proof of service as provided in the foregoing shall be made by appropriate affidavit describing the service which shall be attached to the original and copies of which shall be attached to all copies filed with the Commission. If service has been made by delivery of a copy to the attorney, written acknowledgment thereof on the original filed will be considered proof of service; in such case an appropriate notation of such acknowledgment shall be made on all copies filed.

§1.142 *Copies.*—Unless otherwise specifically provided, an original and fourteen copies of all petitions, motions, pleadings and other documents required or permitted to be filed under these rules shall be furnished the Commission.

PROOF OF OFFICIAL RECORD

§1.151 *Authentication of copy.*—An official record, or entries therein when admissible for any purpose, may be evidenced by an official publication thereof or by a copy attested by the officer having legal custody of the record, or by his deputy, and accompanied with a certificate that such officer has the custody. If the office in which the record is kept within the United States or within a territory or insular possession subject to the dominion of the United States, the certificate may be made by the judge of a court of record of the district or political subdivision in which the record is kept, authenticated by the seal of the court, or may be made by any public officer having a seal of office having official duties in the district or political subdivision in which the record is kept, authenticated by the seal of his office. If the office in which the record is kept is in a foreign state or country, the certificate may be made by a secretary of embassy or legation, consul general, consul, vice consul, or consular agent or by any officer in the foreign service of the United States stationed in the foreign state or country in which the record is kept, and authenticated by the seal of his office.

§1.152 *Proof of lack of record.*—A written statement signed by an officer having the custody of an official record or by his deputy that after diligent search no record or entry of a specified tenor is found to exist in the records of his office accompanied by a certificate as above provided, is admissible as evidence that the records of his office contain no such record or entry.

§1.153 *Other proof.*—This rule does not prevent the proof of official records or of entry or lack of entry therein by any method authorized by any applicable statute or by the rules of evidence at common law.

SUBPENAS

§1.171 *Who may sign and issue.*—Subpenas requiring the attendance and testimony of witnesses, and subpenas requiring the production of any books, papers, schedules of charges, contracts, agreements, and documents relating to any matter under investigation or hearing may be signed and issued as follows: (a) Hearings before the Commission en banc; by any Commissioner; (b) hearings before any designated officer; (1) by any Commissioner; (2) the officer designated to hear a case may sign and issue subpenas in that case; (c) in other cases: By any Commissioner.

§1.172 *Requests; verification and content.*—Unless directed by the Commission upon its own motion, subpenas will be issued only upon request in writing. Requests for subpenas to compel witnesses to produce documentary evidence must be subscribed and verified in accordance with section 1.122 and must specify with particularity the books, papers, or documents desired, and the facts expected to be proved thereby.

§1.173 *Witness fees.*—Witnesses who are subpoenaed and respond thereto are entitled to the same fees including mileage as are paid for like service in the courts of the United States, such fees to be paid by the party at whose instance the testimony is taken at the time the subpoena is served.

§1.174 *Service of subpoenas; return.*—(a) A subpoena may be served by a United States marshal or his deputy or by any other person who is not a party and is not less than 18 years of age. Service of a subpoena upon a person named therein shall be made by delivering a copy thereof to such person and by tendering to him the fees for 1 day's attendance and the mileage allowed by law. When the subpoena is issued on behalf of the United States or an officer or agency thereof, fees and mileage need not be tendered.

(b) If made by any other person, such person shall make affidavit thereof, stating the date, time, and manner of service; and return such affidavit on, or with, the original subpoena in accordance with the form thereon. In case of failure to make service the reasons for the failure shall be stated on the original subpoena. In making service, the original subpoena shall be exhibited to the person served, shall be read to him if he is unable to read, and a copy thereof shall be left with him. The original subpoena, bearing or accompanied by the required return, affidavit, or statement, shall be returned forthwith to the secretary of the Commission, or, if so directed on the subpoena, to the presiding officer before whom the person named in the subpoena is required to appear.

HEARINGS

§1.191 *Classes.*—Hearings before the Commission may be formal or informal.

INFORMAL HEARINGS

§1.192 *Informal; 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 of its Rules and Regulations. For such purposes it may subpoena 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.

FORMAL HEARINGS

§1.193 *Hearing date on related matters.*—In fixing dates for hearings the Commission will, so far as practicable, endeavor to fix the same date for separate hearings (a) on all related matters which involve the same applicant, or arise out of the same complaint or cause; and (b) for separate hearings on all applications which by reason of the privileges, terms, or conditions requested present conflicting claims of the same nature.

§1.194 *Consolidation of cases.*—The Commission, upon motion, or upon its own motion, will, where such action will best conduce to the proper dispatch of business and to the ends of justice, consolidate for hearing (a) any cases which involve the same applicant or arise from the same complaint or cause, or (b) any applications which by reason of the privileges, terms, or conditions requested present conflicting claims of the same nature.

§1.195 *Communications relating to applications.*—There will be maintained in the office of the secretary of the Commission a record of all communications received by the Commission relating to the merits of any application pending before the Commission requesting the granting, renewal, modification, or revocation of any license or construction permit, certificate of convenience and necessity, or rate schedule. Such record shall show the name and address of the person making the statement and the substance of such statement. When the date of hearing has been set, if the matter is designated for hearing, the secretary shall notify all persons shown by the records to have communicated with the Commission regarding the merits of such matter in order that such persons will have an opportunity to appear and give evidence at such hearing: *Provided*, That in the case of communications bearing more than one signature, notice shall be given to the person first signing unless the communication clearly indicates that such notice should be sent to some one other than such person.

No such person shall be precluded from giving any relevant material and competent testimony at such hearing because he lacks a sufficient interest to justify his intervention as a party in the matter.

No such communication will be considered by the Commission in determining the merits of any such matter nor shall any such communication be considered by any examiner unless it has been introduced into evidence at the hearing and appears as a part of the record. The admissibility of any such communication or the secretary's record of any such communication shall be governed by the applicable rules of evidence, and no such communication shall be admissible on the basis of a stipulation unless Commission's counsel as well as counsel for all of the parties shall join in such stipulation.

Such communications, however, may be considered by the Commission if circumstances warrant in deciding whether or not a matter shall be set down for hearing in cases where in the absence of such communication no hearing would be required by the Commission.

§1.196 *Notice of hearing under part I of title III.*—In cases arising under part I of title III of the Act notice of applications received and action thereon shall be given in the following manner:

(a) By publishing the notice of hearing in the Federal Register not less than 30 days in advance of the hearing date;

(b) Notice of the filing of applications under part I of title III of the Act and of the date fixed for hearing on such applications shall be published weekly in the office of the Commission and posted in the office of the secretary.

§1.197 *Notice of hearing under title II or part II of title III.*—In cases arising under title II or part II of title III of the Act, except if specific provision is made by statute or by these rules for actual or constructive notice, the Commission shall give or require reasonable notice.

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CONTINUANCES: EXTENSIONS

§1.201 *Continuances and extensions.*—Continuance in respect to any proceeding or hearing pending before the Commission and extensions of time for making any filing or performing any act required or allowed to be done within a specified time may be granted upon motion for good cause shown, except where the time for performance or filing is limited by statute.

§1.202 *Postponement or change of place.*—The Commission or the presiding officer at a hearing may, after opening any hearing pursuant to notice, recess or adjourn the same for such time as may be necessary, or change the place thereof.

§1.203 *Motions involving delay.*—Requests for continuance shall show diligence by the moving party and shall be made at such time and in such manner as to avoid unnecessary hardship or expense to the parties to the proceeding. Such motions shall show service upon all parties as provided in section 1.141.

ORDER OF PROCEDURE

§1.204 *Order of procedure.*—At hearings on complaints, petitions, applications, or other proceedings for instruments of authorization which the Commission is empowered to issue, the complainant, petitioner, or applicant as the case may be, shall open and close. At hearings on investigation and suspension proceedings under title II of the act, the respondent whose tariffs are under suspension shall open and close. At hearings in all other investigations, the party to whom the order to show cause was issued shall open and close. At hearings under title III of the act on revocations and suspension of operator licenses or modification of licenses under section 312 (b) of the act, or other like proceedings instituted by the Commission, the Commission shall open and close. In hearings upon a consolidated record, the Commission or presiding officer shall designate the order of presentation. Interveners shall follow the party in whose behalf intervention is made, and in all cases where the intervention is not in support of an original party, the Commission, or presiding officer, shall designate at what stage such interveners shall be heard.

EVIDENCE

§1.211 *Rules of evidence.*—Except as otherwise provided herein, the rules of evidence governing civil proceedings in matters not involving trial by jury in the courts of the United States shall govern formal hearings before the Commission: *Provided, however,* That such rules may be relaxed in any case where the ends of justice will be better served by so doing.

§1.212 *Cumulative evidence.*—The introduction of merely cumulative evidence shall be avoided, and the number of witnesses that may be heard in behalf of a party on any issue may be limited.

§1.213 *Further evidence during hearing.*—At any stage of a hearing, the presiding officer may call for further evidence upon any issue and may require such evidence to be presented by any party to the proceeding.

§1.214 *Documents containing matter not material.*—Where material and relevant 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.

§1.215 *Copies of exhibits.*—No document or exhibit, or part thereof shall be received as, or admitted in, evidence unless offered in duplicate. In addition, when exhibits of a documentary character are to be offered in evidence, copies must be furnished to opposing counsel unless the presiding officer otherwise directs. Whenever practicable the parties should interchange copies of exhibits before or after commencement of the hearing.

§1.216 *Mechanical reproductions as evidence.*—Unless offered for the sole purpose of attempting to prove or demonstrate sound effect, mechanical or physical reproductions of sound waves shall not be admitted in evidence. Any party desiring to offer any matter alleged to be contained therein or thereupon shall have such matter typewritten on paper of the size prescribed by the rules of the Commission, and the same shall be identified and offered in duplicate in the same manner as other exhibits.

§1.217 *Tariffs as evidence.*—In case any matter contained in a tariff schedule on file with the Commission is offered in evidence, such tariff schedule need not be produced or marked for identification, but the matter so offered shall be specified with particularity (tariff and page number) in such manner as to be readily identified, and may be received in evidence by reference subject to check with the original tariff schedules so on file.

DEPOSITIONS

§1.221 *Request for orders to take; time of filing; contents.*—The Commission, either on its own motion, or on formal notice of a party to a proceeding, will issue an order to take a deposition. Motions to take depositions shall be filed with the Commission not less than 25 days before the proposed date for taking of the deposition, and shall set forth the names and addresses of the witnesses, a specific statement as to each witness of the matters and facts concerning which it is expected such witness will testify, the place where, the time when, the officer before whom, and the cause or reason why such deposition should be taken. Such motion shall be subscribed and verified as provided in section 1.122, and shall be accompanied by proof of service and by the proposed order in a sufficient number of copies to be served on all parties. If said order is allowed, the secretary shall mail a copy thereof to all parties to the proceeding at least 15 days prior to the date fixed for the taking of testimony.

§1.222 *Contents of order.*—The order issued authorizing the taking of a deposition shall state the name and address of each witness, the matters and facts concerning which it is expected such witness will testify, the place where, the time when, and the designated officer before whom the witness is to testify as provided in section 409 (e) of the act.

§1.223 *Record of examination; oath; objections.*—The officer before whom the deposition is to be taken shall put the witness on oath and shall personally or by someone acting under his direction and in his presence, record the testimony of the witness. The testimony shall be taken stenographically and transcribed, unless the parties agree otherwise. All objections made at the time of the examination to the qualifications of the officer taking the deposition, or to the manner of taking it, or to the evidence presented, or to the conduct of any party, and any other objection to the proceedings, shall be noted by the officer upon the deposition. Evidence objected to shall be taken subject to the objections. In lieu of participating in the oral examination, parties served with notice of taking a deposition may transmit written interrogatories to the officer, who shall propound them to the witness and record the answers verbatim.

§1.224 *Submission to witness; changes; signing.*—When the testimony is fully transcribed the deposition of each witness shall be submitted to him for examination and shall be read to or by him. Any changes in form or substance which the witness desires to make shall be entered upon the deposition by the officer with a statement of the reasons given by the witness for making them. The deposition shall then be signed by the witness, unless the parties by stipulation waive the signing or the witness is ill or cannot be found or refuses to sign. If the deposition is not signed by the witness, the officer shall sign it and state on the record the fact of the waiver or of the illness or absence of the witness or the fact of the refusal to sign together with the reason, if any, given therefor; and the deposition may then be used as fully as though signed, unless on a motion to suppress the Commission holds that the reasons given for the refusal to sign require rejection of the deposition in whole or in part.

§1.225 *Certification and filing by officer; copies.*—The officer shall certify on the deposition that the witness was duly sworn by him and that the deposition is a true record of the testimony given by the witness, and that said officer is not of counsel or attorney to either of the parties, nor interested in the event of the proceeding or investigation. He shall then securely seal the deposition in an envelope endorsed with the title of the action and marked "Deposition of (here insert name of witness)" and shall promptly send the original and one copy thereof together with the original and one copy of all exhibits by registered mail to the secretary of the Commission.

§1.226 *Waiver of objections.*—Objections to the form of question and answer shall be made before the officer taking the depositions, and if not so made, shall be deemed waived: *Provided, however,* That if no representative of the Commission is present at the taking of the deposition of any witness, such deposition shall be received in evidence at the hearing when offered subject to such legal objection by the Commission as may be proper.

§1.227 *Time of filing.*—All depositions shall be filed with the Commission not later than 5 days before the date of the hearing in which they are to be offered as evidence, and section 1.10 shall not apply or in any wise serve to extend this time: *Provided, however,* That the presiding officer at any hearing may, on motion which shall show diligence on the part of the moving party, waive the requirements of this section.

§1.228 *Inclusion in record.*—No deposition shall constitute a part of the record in any proceeding until received in evidence at a hearing, unless otherwise ordered by the Commission.

CONDUCT OF HEARINGS

§1.231 *Conduct of hearings.*—Except for hearings before the Commission en banc the Commission will provide for the conduct of each hearing by a specific order of reference and unless otherwise specified in such order:

(a) *Authority of presiding officer.*—The presiding officer at the hearing shall have authority to administer oaths, examine witnesses, and receive evidence at any place in the United States designated by the Commission, and to rule upon the admissibility of evidence and other matters that normally and properly arise in the course of the hearing, but shall have no power to decide any motion to dismiss the proceeding or other motion which involves final determination of the merits of the proceeding.

(b) *Transcript filed with Secretary.*—After the close of the hearing the complete transcript of testimony taken, together with any exhibits and any briefs or memoranda of law filed theretofore on behalf of any party, shall be filed in the office of the secretary of the Commission.

(c) *Corrections to transcripts.*—Suggested corrections to transcripts of records shall be considered only if offered within 10 days after the date the transcript is filed with the Commission. Suggested corrections shall be served upon all other parties participating in the proceeding as provided in section 1.141 prior to the filing with the Commission. The presiding officer at the hearing shall have authority to act upon motions to correct the record.

(d) *Findings proposed by parties.*—Within 20 days from the filing of the transcript of record of the hearing, each party to the proceeding shall file with the Commission proposed findings of fact and conclusions which shall be served upon all parties participating in the hearing in the manner provided in section 1.141. Failure to file proposed findings of fact and conclusions by any such party within the time so required, shall be deemed a waiver by such party of any right of further participation in the proceeding, including oral argument if any is held.

(e) *Contents of findings proposed by parties.*—Such proposed findings of fact shall be set forth in serially numbered paragraphs and shall set out in detail and with particularity all basic evidentiary facts developed by the evidence (with appropriate citations to the transcript of record or exhibits relied on) supporting the conclusions proposed by the party filing same. Proposed conclusions shall be separately stated. Proposed findings of fact and conclusions submitted by a person other than an applicant may be limited to those issues in connection with the hearing which affect the interests of such person. Such proposed findings and conclusions may be accompanied by briefs or memoranda of law.

(f) *Proposed decisions of Commission.*—The Commission will thereafter enter its proposed report or findings of fact and conclusions: *Provided, however,* That if the proposed findings of fact and conclusions filed by the parties present no substantial conflict, and the Commission is in accord with the ultimate conclusions proposed, it will, if it deems such action will best conduce to the proper dispatch of business and to the ends of justice, issue a final order with or without findings of fact and conclusions in lieu of issuing its proposed findings of fact and conclusions in accordance with this paragraph.

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(g) *Exceptions; oral argument.*—Within 20 days from the filing of the Commission's proposed report or findings of fact and conclusions the parties to the proceeding may file exceptions to the same which shall point out with particularity alleged errors in said report or findings of fact and conclusions and shall contain specific reference to the page of the transcript of hearing or exhibit on which the exception is based, such exceptions shall be accompanied by a memorandum brief in support thereof, and may request oral argument.

(h) *Reply briefs.*—Reply memorandum briefs may be filed by any party to the proceeding within 30 days from the filing of the Commission's proposed report or findings of fact and conclusions. If no request for oral argument is made within said 30-day period all parties shall be considered as waiving any right thereto.

(i) *Service of exceptions or briefs.*—At or prior to the date fixed for the filing of any exceptions, memorandum brief, or request for oral argument, the party filing the same shall serve at least one copy thereof, as provided in section 1.141, upon all other parties to the proceeding, and no exceptions or memorandum brief will be accepted or considered by the Commission unless accompanied by an affidavit showing this requirement has been met.

(j) *Request for oral argument; waiver.*—Within 5 days of the filing with the Commission of a request for oral argument by any party to a proceeding all parties to such proceeding shall file written notice of desire to appear and participate in such oral argument. In the absence of the filing of such written notice by any party his right to oral argument will be considered as waived.

(k) *Number of copies.*—Fifteen copies of any proposed findings of fact and conclusions, exceptions, or memorandum briefs filed in connection with any hearing shall be filed with the Commission.

§1.232 *Hearings before more than one person.*—The authority to perform any act in connection with a hearing vested in a "presiding officer" under these rules shall be vested in a majority of the persons conducting the hearing if the hearing is conducted by more than one person.

MOTIONS DOCKET

§1.251 *Matters to be heard.*—All motions, petitions, or matters in cases designated for formal 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, shall be placed upon the motions docket for hearing.

§1.252 *Proposed orders.*—All motions or petitions shall be accompanied by a proposed order or orders which, if the relief requested is granted, may be entered in the docket of the proceeding so as to evidence all action taken on the motion or petition.

§1.253 *Time of calling; continuances.*—The motions docket will be called at the offices of the Commission at such times as the Commission may designate, and the presiding officer shall have the authority to continue any motion, petition, or other matter presented to a future date, and may, proper notice having been given, hear any motion at any time.

§1.254 *Time for filing motions.*—No such motion, petition, or other matter presented shall be called, considered, or determined in the absence of consent by all parties unless the same shall have been on file, accompanied by proof of service upon all interested parties, with the Commission for a period of 5 days: *Provided, however,* That all petitions, motions, or other matters involving parties residing in the States set out in section 1.10 or residing beyond the continental limits of the United States shall not be called, considered, or determined in the absence of consent of all parties until the expiration of 7 days.

§1.255 *Oppositions; right to be heard.*—During the time specified in section 1.254, any party in interest shall have the right to file an opposition thereto. Such opposition shall show service on the petitioner or moving party. Parties filing oppositions shall have the right to be heard on the day designated for hearing of the motion, petition, or other matter against which the opposition is directed. Any party desiring to waive oral argument on any motion, or opposition thereto, may indicate such desire by an appropriate notation or by a statement to that effect upon the call of the docket. In case oral argument is waived by any party, such motion or opposition shall be considered together with any memoranda or briefs which may be filed in support thereof; and the waiving of oral argument by any party shall not preclude the holding of oral argument by any other party desiring same.

§1.256 *Adverse ruling; exceptions.*—Where a ruling on any petition, motion, or other matter is adverse to an interested party, said interested party may except thereto, and when the matter comes on for the hearing of the evidence, he shall state into the record at such hearing that he reserves an exception to the ruling made by the presiding officer of the motions docket and request that such exception be noted and carried forward in the record. In the event such interested party fails to note his exception taken at the time ruling was made by the presiding officer of the motions docket, such exception shall be considered waived. Within 2 days from the date of any ruling on any petition, motion, or other matter by the presiding officer of the motions docket, any interested party may petition for a review of such ruling by a quorum of the Commission, such petition for review shall not be essential for the preservation of any exception taken.

REHEARINGS

§1.271 *Petitions; contents.*¹—Any party whose interests are aggrieved or adversely affected by any decision, order, or requirement of the Commission may file a petition for rehearing of the same or any matter determined therein as provided in section 405 of the act. Such petition for rehearing may request (1) reconsideration, either in cases decided after hearing or in cases of applications granted without hearing under title III of the act; (2) reargument; (3) reopening of the proceeding; (4) amendment of any finding, or (5) other relief. Such petition shall be specific as to the form of relief sought and, subject to this requirement, may contain alternative requests. Each such petition shall state with particularity in what respect the decision, order, or requirement or any matter determined therein is claimed to be unjust, unwarranted, or erroneous, and with respect to any finding of fact must specify the pages of record relied on. Where the existence of newly discovered evidence is claimed, the petition must be accompanied by a verified statement of the

¹For specific rules regarding petitions for rehearing in connection with applications under Title III, see section 1.387.

facts, together with the facts relied on to show that the petitioner, with due diligence, could not have known or discovered such facts at the time of the hearing.

§1.272 *Subscription and service.*—Each petition for rehearing shall be subscribed as provided in section 1.122 and served upon all parties participating in the hearing in the manner provided in section 1.141. In case the petition seeks reconsideration of a decision, order, or requirement made without a hearing, the party filing the petition shall serve the same in the manner provided in section 1.141 upon the party or parties to whom such decision, order, or requirement was directed.

§1.273 *Opposition.*—An opposition to any petition for rehearing may be filed within 10 days after the filing of such petition, and shall be subscribed or verified as provided in section 1.122 and served upon all parties participating in the hearing in the manner provided in section 1.141.

§1.274 *Special calendar when granted.*—In case any petition for rehearing is granted, whether the taking of additional testimony is ordered or otherwise, the case shall be placed upon a special calendar and consideration of the same shall be expedited.

FINANCIAL, OWNERSHIP AND OTHER REPORTS OF BROADCAST LICENSEES

§1.301 *Financial report.*—Each licensee of a broadcast station (standard, FM, television, and international) shall file with the Commission on or before April 1 of each year (on Form 324 or such other form as the Commission may prescribe, together with supporting schedules) a balance sheet showing its financial condition as of December 31 of the preceding calendar year and an income statement for said calendar year. Each such form shall be subscribed as provided in §1.121 of the Commission's regulations.

§1.302 *Filing of contracts.*—Each licensee of a broadcast station (standard, FM, television, and international) shall file with the Commission within 30 days of execution thereof verified copies of all documents, instruments, contracts (the substance of oral contracts or understanding shall be reported in writing for submission) together with amendments, supplements, and changes therein and cancellations thereof relating to ownership, management or control of licensee of station, or of any of licensee's stock, rights or interests therein; the use, management, or operation of licensed facilities; and agreements relating to network service, transcription service or bulk time sales (amounting to two hours or more per day); including but not limited to (a) Articles of partnership, association, or incorporation; (b) by-laws affecting character of organization, control, number or powers of its officers or directors, the classification or voting rights of any stock; (c) any document, instrument, or contract relating to or affecting ownership of licensee, rights or interests therein, its stock, or voting rights thereto; (d) management contracts, network contracts, transcription network contracts, and time sales to brokers.

§1.303 *Ownership reports.*—(a) *Annual ownership reports.* The licensee of each broadcast station (standard, FM, television, and international) shall file on or before April 1 of each year on FCC Form 323 an annual ownership report and shall show the following information as of December 31 of the preceding calendar year:

- (1) In the case of an individual, the name of such individual.
- (2) In the case of a partnership; the names of the partners and the interests of each partner.²
- (3) In the case of a corporation or association: (i) Capitalization, with a description of the classes and voting power of stock authorized and the shares of each class issued and outstanding; (ii) the name, residence, citizenship, and stockholdings of officers and directors, and stockholders; (iii) full information with respect to the interest and identity of any person whether or not a stockholder of record, having any interest, direct or indirect, in the licensee or any of its stock;

For example:

(a) Where A is the beneficial owner or votes stock held by B, the same information should be furnished for A as is required for B.

(b) Where X corporation controls the licensee, or hold 25% or more of the stock of the licensee, the same information should be furnished with respect to X corporation (its capitalization, officers, directors, and stockholders and the amount of stock in X held by each) as is required in the case of the licensee, together with full information as to the identity and citizenship of the person authorized to vote licensee's stock.

(c) The same information should be furnished as to Y corporation if it controls X corporation or holds 25% or more of the stock of X, and as to Z corporation if it controls Y corporation or holds 25% or more of the stock of Y and so on back to natural persons.

(iv) full information as to family relationship or business association between two or more officials and/or stockholders.

(4) In the case of all licensees: (i) The name, residence, position and date of appointment of operating personnel determining program policy (such as general manager, program director, etc.); (ii) a list of all contracts still in effect required to be filed with the Commission by § 1.302 showing the date of execution and expiration of each contract; (iii) any interest which the licensee may have in any other broadcast station.

(b) *Interim ownership reports.* An interim ownership report shall be filed by each licensee on FCC Form 323A describing any change in information required in the annual ownership report from that previously reported within 30 days after any such change occurs, including without limitation:

- (1) Any change in capitalization or organization.
- (2) Any change in officers and directors or in operating personnel determining program policy.
- (3) Any transaction affecting the ownership, direct or indirect, or voting rights of licensee's stock, such as (i) a transfer of stock, (ii) issuance of

¹For the year 1945, an Annual Ownership Report shall be filed with the Commission on FCC Form 323 on or before November 1, 1945, showing the information by § 1.303 as of June 30, 1945.

²Any change in partners or in their rights will require prior consent of the Commission upon an application for consent to assignment of license.

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new stock or disposition of treasury stock, (iii) acquisition of licensee's stock by the issuing corporation.

(4) Any change in the officers, directors or stockholders of a corporation other than the licensee such as X, Y or Z Corporation described in the example above.

Provided, however, That in the case of a change in the officers, directors or stockholders of a corporation other than the licensee (such as X, Y or Z corporation described in the example above), such change need not be reported in the interim report unless that corporation directly or indirectly owns 25% or more of the voting stock in the licensee.¹

(c) *Exceptions.* Where information is required under paragraphs (a) or (b) of this section with respect to a corporation having more than 50 stockholders, such information need be filed only with respect to stockholders having 1% or more of the stock of the corporation.

§ 1.304 *Definitions.*—As used in §§ 1.301—1.303:

(a) "Stock" shall include any interest, legal or beneficial in, or right or privilege in connection with stock.

(b) "Officer" and "director" shall include the comparable officials in unincorporated associations.

(c) "Contract" shall include any agreement (including, without limitation, an option, trust, or pledge) or any modification thereof, express or implied, oral or written.

SPECIAL PROVISIONS RELATING TO RADIO

(Application under part I of title III of the act)

§ 1.351 *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:

Class of station	Number of application forms required and method of filing
a. All classes of Alaskan stations, except broadcast and amateur.	3 copies via inspector in charge, radio district No. 14, Seattle, Wash.
b. Aircraft	1 copy direct to Washington, D. C.
c. Geophysical	Do.
d. All classes including portable, except standard broadcast, high frequency broadcast, international broadcast, television and amateur.	2 copies direct to Washington, D. C.
e. Ship	1 copy direct to Washington, D. C.
f. Standard broadcast, high frequency broadcast, international broadcast and television.	3 copies direct to Washington, D. C.
g. Amateur	1 copy to be sent as follows: (a) To proper district office if it requires personal appearance for operator examination under direct supervision from that office; (b) direct to Washington, D. C., in all other cases, including examination for class C privileges.

§ 1.352 *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.

§ 1.353 *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.

§ 1.354 *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.

§ 1.355 *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 60 days prior to the contemplated removal and/or installation.

§ 1.356 *Forfeiture of construction permits: extensions of time.*—(a) A construction permit shall be automatically forfeited if the station is not ready for operation within the time specified therein or within such further time as the Commission may have allowed for completion, and a notation of the forfeiture of any construction permit under this provision will be placed in the records of the Commission as of the expiration date.

(b) Any application² for extension of time within which to construct a station shall be filed at least thirty days prior to the expiration date of such permit if the facts supporting such application for extension are known to the applicant in time to permit such filing. In other cases such applications will be accepted upon a showing satisfactory to the Commission of sufficient reasons for filing within less than thirty days prior to the expiration date. Such applications will be granted upon a specific and detailed showing that the failure to complete was due to causes not under the control of the grantee, or upon a specific and detailed showing of other matters sufficient to justify the extension.

§ 1.357 *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.

§ 1.358 *Where construction permit not required.*—Each application for a new license, except amateur, where a construction permit is not a prerequisite

thereto, shall be filed at least 60 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.

§ 1.359 *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 60 days prior to the contemplated modification of license: *Provided, however,* That in emergencies and for good cause shown, the requirements hereof may be waived insofar as time for filing is concerned.

§ 1.360 *Renewal of license.*—Unless otherwise directed by the Commission, each application for renewal of license shall be filed at least 60 days prior to the expiration date of the license sought to be renewed. 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 and reports currently required by Sections 1.301 and 1.303, reference to which by date and file number shall be included in the application.

§ 1.362 *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 date certain, 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.

§ 1.363 *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.

§ 1.364 *Assignment or transfer of control.*—(a) *General.*—(1) Voluntary: Application for consent to voluntary assignment of a construction permit or license, or for consent to voluntary transfer of control of a corporation holding a construction permit or license, shall be filed with the Commission at least 60 days prior to the contemplated effective date of assignment or transfer of control.

(2) Involuntary: In the event of the death or legal disability of a permittee or licensee, or a member of a partnership, or a person directly or indirectly in control of a corporation, which is a permittee or licensee.

(i) the Commission shall be notified in writing promptly of the occurrence of such death or legal disability, and

(ii) within thirty days after the occurrence of such death or legal disability (except in the case of a ship or amateur station), application shall be filed for consent to involuntary assignment of such permit or license or for involuntary transfer of control of such corporation to a person or entity legally qualified to succeed to the foregoing interests under the laws of the place having jurisdiction over the estate involved. In the case of ship and amateur stations, involuntary assignment of licenses will not be made; such licenses shall be surrendered for cancellation upon the death or legal disability of the licensee.

(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.

§ 1.365 *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 10 days previous to the date of proposed operation: *Provided, however,* That any such request received within less than 10 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 30 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.

¹ Informal applications.

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² Before any change in the organization, capitalization, officers, directors or stockholders of a corporation other than licensee, which results in a change in the control of the licensee, prior Commission consent must be received under Section 310 (b) of the Communications Act.

² F. C. C. Form No. 701.

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(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 subparagraphs (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.

§1.366 Special service authorizations.—Special service authority may be issued to the licensee of a standard broadcast station or, in connection with the furnishing of facilities for service to the United States Government, to the licensee of an international broadcast station or an international point-to-point station, for a service other or beyond that authorized in its existing license for a period not exceeding that of its existing license.

Application for special service authorization for standard broadcast stations must be made by formal application¹ and a satisfactory showing must be made 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 Section 3.32 of the Rules and Regulations;

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

§1.367 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.

§1.368 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.

§1.369 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 by his successor or assignee, or on behalf of or for the benefit of the original parties in interest, until after the lapse of 12 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 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 12 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.

§1.370 Pending appeal.—Where an appeal has been taken from the action of the Commission in denying a particular application, 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 UNDER TITLE III

§1.381 Grants without a hearing.—Where an application for radio facilities is proper upon its face, and where it appears from an examination of the application and supporting data that (1) the applicant is legally, technically and financially qualified; (2) a grant of the application would not involve modification, revocation, or non-renewal of any existing license or outstanding construction permit; (3) a grant of the application would not cause electrical interference to an existing station or station for which a construction permit is outstanding within its normally protected contour as prescribed by the applicable Rules and Regulations; (4) a grant of the application would not preclude the grant of any mutually exclusive application; and (5) a grant of the application would be in the public interest, the Commission will grant the application without a hearing.

§1.382 Partial grants.—Where the Commission without a hearing grants any application in part, or with any privileges, terms, or conditions other than those requested, the action of the Commission shall be considered as a grant of such application unless the applicant shall, within 20 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.

§1.383 Designation for hearing.—Applications will be designated for hearing in the following cases:

(a) Where it does not appear from an examination of the application that the applicant is legally, technically or financially qualified; or

(b) Where a grant of the application would require the modification, revocation, or non-renewal of license of an existing station or of any outstanding construction permit; or

(c) Where a grant of the application would cause electrical interference to an existing station or station for which a construction permit is outstanding within its normally protected contour as prescribed by the applicable Rules and Regulations; or

(d) Where it does not appear from an examination of the application that a grant of the application will be in the public interest.

(e) Where a grant of the application would preclude the grant of an application or applications mutually exclusive with it. However, the Commission may, if public interest will be served thereby, make a conditional grant of one of the applications and designate all of the mutually exclusive applications for hearing. Such conditional grant will be made upon the express condition that such grant is subject to being withdrawn if at the hearing it is shown that public interest will be better served by a grant of one of the other applications. Such conditional grants will be issued only where it appears:

(i) That some or all of the applications were not filed in good faith but were filed for the purpose of delaying or hindering the grant of another application; or

(ii) That public interest requires the prompt establishment of radio service in a particular community or area; or

(iii) That a grant of one or more applications would be in the public interest and that a delay in making a grant to any applicant until after the conclusion of a hearing on all applications might jeopardize the rights of the United States under the provisions of international agreement to the use of the frequency in question; or

(iv) That a grant of one application would be in the public interest and that it appears from an examination of the remaining applications that they cannot be granted because they are in violation of provisions of the Communications Act, or of other statutes, or of the Commission's rules and regulations.

§1.384 Procedure when case is designated for hearing.—(a) When an application has been designated for hearing, the Secretary of the Commission will 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. In order to avail himself of the opportunity to be heard, the applicant, in person or by his attorney, shall, within 15 days of the mailing of the notice of designation for hearing by the Secretary, file with the Commission 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. In cases involving applications for facilities other than AM broadcast, FM broadcast, international broadcast, or television, the applicant shall submit with his appearance an additional copy of his application and supporting documents.

(b) The Commission will on its own motion name as parties to the hearing:

(i) Any existing licensee or holder of an outstanding construction permit who, if the application were granted, would suffer electrical interference within his normally protected contour as prescribed by the Commission's Rules and Regulations.

(ii) Any existing licensee or holder of an outstanding construction permit whose license or construction permit would have to be modified or revoked, or whose application for renewal of license would have to be denied, if the application in question were granted.

(iii) Any person who, prior to the time the application in question was designated for hearing, had filed with the Commission a mutually exclusive application. Persons filing mutually exclusive applications after the application in question has been designated for hearing will be named as parties only if the Commission in its discretion deems such action advisable.

§1.385 Petitions to intervene.—(a) Where the Commission has failed on its own motion to name as parties to a hearing any person specified in Section 1.384(b), such person will be permitted to participate in the proceeding by filing a petition to intervene showing that he comes within the provisions of Section 1.384(b). Where the petition to intervene is based upon a claim that a grant of the application would cause electrical interference to an existing station or a station for which a construction permit is outstanding within its normally protected contour as prescribed by the applicable Rules and Regulations, the petition must be accompanied by an affidavit of a qualified radio engineer which shall show either by reference to the Commission's Standards of Good Engineering Practice or to actual measurements made in accordance with the methods prescribed by the Commission's Standards of Good Engineering Practice that electrical interference will be caused to the existing station or station for which a construction permit is outstanding within the normally protected contour of the station.

(b) Any other person desiring to participate in the hearing may file a petition to intervene. The petition must set forth the interest of the petitioner in the proceedings and must show how such person's participation will assist the Commission in the determination of the issues in question. The Commission in its discretion may grant or deny such petition or may permit intervention by such persons limited to particular issues or to a particular stage of the proceeding.

(c) The granting of any petition to intervene shall not have the effect of changing or enlarging the issues specified in the Commission's notice of hearing unless the Commission shall on motion amend the same.

(d) Petitions to intervene under this section must be filed with the Commission not later than 15 days after the issues in the hearing have first been published in the Federal Register. Any person desiring to file a petition to intervene after the expiration of such 15 days must set forth the reason why it was not possible to file the petition within the prescribed 15 days. Unless good cause is shown for delay in filing, the petition will not be granted.

§1.386 Motions to enlarge or change the issues.—Motions to enlarge or change the issues may be filed by any party to a hearing. Such motions must be filed with the Commission not later than 15 days after the issues in the hearing have first been published in the Federal Register. Any person desiring

¹ Form 317.

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to file a motion to enlarge or change the issues after the expiration of such 15 days must set forth the reason why it was not possible to file the petition within the prescribed 15 days. Unless good cause is shown for delay in filing, the motion will not be granted.

§1.387 *Petitions for reconsideration or for rehearing.*—(a) Where an application has been granted without a hearing, any person aggrieved or whose interests would be adversely affected thereby may file a petition for reconsideration of such action. Such petition must be filed with the Commission within 20 days after public notice is given of the Commission's action in granting the application. Such petition will be granted if the petitioner shows that:

(i) Petitioner is an existing licensee or permittee and a grant of the application would require the modification, revocation, or non-renewal of his license or construction permit; or

(ii) That petitioner is an existing licensee or permittee and a grant of the application would cause interference to his station within the normally protected contour as prescribed by applicable Rules and Regulations; or

(iii) At the time the application was granted, petitioner had a mutually exclusive application pending before the Commission; or

(iv) A grant of the application is not in the public interest.

(b) Where an application has been granted or denied after hearing, petitions for rehearing may be filed within 20 days after public notice is given of the Commission's action in granting or denying the application. Petitions for rehearing by persons not parties to the Commission's hearing will not be granted unless good cause is shown as to why it was not possible for such person to participate earlier in the Commission's proceeding.

(c) Where a petition for reconsideration or for rehearing is based upon a claim of electrical interference within the normally protected contour of an existing station or a station for which a construction permit is outstanding, such petition must be accompanied by an affidavit of a qualified radio engineer which shall show either by reference to the Commission's Standards of Good Engineering Practice or to actual measurements made in accordance with the methods prescribed by the Commission's Standards of Good Engineering Practice that electrical interference will be caused to the station within its normally protected contour. If the claim of interference is not based upon actual measurements made in accordance with the Standards of Good Engineering Practice, it may be controverted by affidavit containing results of actual measurements made in accordance with the Standards of Good Engineering Practice.

(d) Each petition for reconsideration or rehearing shall be subscribed as provided in Section 1.122 and served upon all parties participating in the hearing in the manner provided in Section 1.141. In the case of a petition for reconsideration of a decision, order, or requirement made without a hearing, the party filing the petition shall serve the same in the manner provided in Section 1.141 upon the party or parties to whom such decision, order, or requirement was directed.

(e) Any opposition to a petition for reconsideration or rehearing may be filed within 10 days after the filing of such petition.

(f) Petitions for reconsideration or rehearing filed under this section may request (1) reconsideration, either in cases decided after hearing or in cases of applications granted without hearing; (2) reargument; (3) reopening of the proceeding; (4) amendment of any finding; or (5) such other relief as may be appropriate. Such petition shall state specifically the form of relief sought and, subject to this requirement, may contain alternative requests. Each such petition shall state with particularity in what respect the decision, order, or requirement or any matter determined therein is claimed to be unjust, unwarranted, or erroneous, and with respect to any finding of fact must specify the pages of record relied on. Where the petition is based upon a claim of newly discovered evidence, it must be accompanied by a verified statement of the facts relied upon, together with the facts relied on to show that the petitioner, with due diligence, could not have known or discovered such facts at the time of the hearing.

[Proposed Rule] §1.388 *Special rules relating to action on applications for assignment and transfer of control.*—(a) Applications for consent to the assignment of a construction permit or license for an AM, FM, television, or other broadcast station or for consent to the transfer of control of a corporation holding such a construction permit or license shall be filed with the Commission on Form FCC No. 314 (Assignment of License) or FCC No. 315 (Transfer of Control). Each application shall be accompanied by a copy of a proposed notice in a form prescribed by the Commission which notice the licensee or permittee shall cause to be published at least twice a week for the 3 weeks immediately following the filing of such application in a daily newspaper of general circulation published in the community in which the station is located. The notice shall state the terms and conditions of the proposed assignment or transfer, the name of the proposed assignee or transferee, and, further, that any other person desiring to purchase the facilities upon the same terms and conditions may file an application to this effect with the Federal Communications Commission within 60 days from the date of the first publication of the notice, which date shall be expressly set forth therein. Upon receipt of the application, the Commission itself will issue a similar public notice stating the terms and conditions of the proposed sale and stating that others may file competing applications for the same facilities upon the same terms and conditions.

(b) No action on any such application will be taken by the Commission for a period of 60 days from the date of filing, during which time any person desiring to purchase the facilities upon the same terms and conditions may file a competing application. In the case of such competing application, it shall be necessary for the applicant to execute only so much of the application form as relates to the proposed assignee or transferee—FCC Form No. 314, Part II, and Form No. 315, Part III.

(c) If no competing application is filed during this 60-day period, the Commission will consider the original application upon its merits and will grant it if it appears from an examination of the application and supporting data public interest will be served thereby; otherwise it will be designated for hearing. If, during such 60-day period, any other application is filed, all such applications will then be considered simultaneously upon their merits, and if, upon such consideration, it appears that the proposed assignee or transferee selected by the licensee is the best qualified and that the transfer would otherwise be in the public interest, the Commission will grant the original application without a hearing. If the

Commission is unable to make such a determination upon consideration of the several applications, the original application and all competing applications will be designated for hearing, to be heard in a consolidated proceeding, to determine among other things which of the applicants is best qualified to operate the station in the public interest.

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DEFINITIONS¹

§2.1 *Permittee.*—"Permittee" means the holder of a radio station construction permit.

§2.2 *Station licensee.*—"Station licensee"² means the holder of a radio station license.

§2.3 *Operator licensee.*—"Operator licensee" means the holder of a license or permit for the technical operation (manipulate the controls) of a licensed radio station.

§2.4 *Radio station.*—"Radio station" or "Station" means a station equipped to engage in radio communication or radio transmission of energy. A station includes all apparatus used at a particular location for one class of service. Radio stations are classified according to the nature of the service they furnish and in each service there may be several classes of radio stations as hereinafter provided.

§2.5 *Useful radio spectrum.*—"Useful radio spectrum" means the total

¹ For additional definitions see Appendix A of rules, not published herewith.

² A licensee may hold more than one license. The provisions of any rules of the Commission imposing requirements on licensees shall be considered to apply only with respect to the particular class of station to which the rule relates unless the context otherwise clearly requires.

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number of frequencies or wavelengths which may be used for the transmission of energy, communications, or signals by radio.¹

§2.6 *Television*.—"Television" is a system of communication in which transient visual images of moving or fixed objects are transmitted for reception by visual observation.

§2.7 *Facsimile*.—"Facsimile" is a system of communication in which images are transmitted for record reception.

§2.8 *Type A facsimile*.—"Type A facsimile" is a system of facsimile communication in which images are built up of lines or dots of constant intensity.

§2.9 *Type B facsimile*.—"Type B facsimile" (telephotography, photoradio, etc.), is a system of facsimile communication in which images are built up of lines or dots of varying intensity.

§2.10 *Cycles, kilocycles, megacycles*.—In these regulations and in any instrument of authorization issued pursuant thereto the term "cycles" shall be construed to mean cycles per second; "kilocycles" to mean kilocycles per second; and "megacycles" to mean megacycles per second.

§2.11 *Carrier wave*.—A "carrier wave" is:

(a) In a frequency stabilized system, the sinusoidal component of a modulated wave whose frequency is independent of the modulating wave; or

(b) The output of a transmitter when the modulating wave is made zero; or

(c) A wave generated at a point in the transmitting system and subsequently modulated by the signal; or

(d) A wave generated locally at the receiving terminal which when combined with the sidebands in a suitable detector produces the modulating wave.

§2.12 *Carrier frequency*.—A "carrier frequency" is the frequency of the carrier wave.

§2.13 *Authorized, licensed, assigned frequency*.—"Authorized frequency", "licensed frequency", or "assigned frequency" means the carrier frequency assigned to a station by the Commission and specified in the instrument of authorization.

§2.14 *Operating frequency*.—"Operating frequency" means the carrier frequency that is actually generated by a station.

§2.15 *Communication band*.—"Communication band" means the frequency band or width of the frequency band required for the type of emission authorized.

§2.16 *Authorized band*.—"Authorized band" means the frequency band or width of the frequency band within which the emissions of a station shall be confined. Its width comprises the "communication band" and twice the "frequency tolerance."

§2.17 *Authorized or licensed power*.—"Authorized power" or "licensed power" means the power assigned to a radio station by the Commission and specified in the instrument of authorization.

§2.18 *Operating power*.—"Operating power" means the power that is actually supplied to the radio station antenna. This power is computed by one of the several methods hereinafter described in these regulations.

§2.19 *Maximum rated carrier power*.—"Maximum rated carrier power" is the maximum power at which the transmitter can be operated satisfactorily and is determined by the design of the transmitter and the type and number of vacuum tubes used in the last radio stage.

§2.20 *Plate input power*.—"Plate input power" means the product of the direct plate voltage applied to the tubes in the last radio stage and the total direct current flowing to the plates of these tubes, measured without modulation.

§2.21 *Antenna power*.—"Antenna input power" or "antenna power" means the product of the square of the antenna current and the antenna resistance at the point where the current is measured.

§2.22 *Antenna current*.—"Antenna current" means the radio-frequency current in the antenna with no modulation.

§2.23 *Antenna resistance*.—"Antenna resistance" means the total resistance of the transmitting antenna system at the operating frequency and at the point at which the antenna current is measured.

§2.24 *Modulation*.—"Modulation" is the process of producing a wave, some characteristic of which varies as a function of the instantaneous value of another wave, called the modulating wave.

§2.25 *Modulator stage*.—"Modulator stage" means the last amplifier stage of the modulating wave which modulates a radio-frequency stage.

§2.26 *Modulated stage*.—"Modulated stage" means the radio-frequency stage to which the modulator is coupled and in which the continuous wave (carrier wave) is modulated in accordance with the system of modulation and the characteristics of the modulating wave.

§2.27 *Last radio stage*.—"Last radio stage" means the oscillator or radio-frequency-power amplifier stage which supplies power to the antenna.

§2.28 *Percentage modulation (amplitude)*.—"Percentage modulation" with respect to an amplitude modulated wave means the ratio of half the difference between the maximum and minimum amplitudes of the amplitude modulated wave to the average amplitude, expressed in percentage.²

¹ At the present development of the art the useful radio spectrum is considered to extend from 10 kilocycles to 3000000 kilocycles or 30000 meters to 0.01 meters. These frequencies are classified into bands with designations and abbreviations as follows:

	Frequency in Kilocycles	Designations	Abbreviations
	10 to 30 inclusive	Very Low	VLF
Above	30 to 300 "	Low	LF
"	300 to 3000 "	Medium	MF
"	3000 to 30000 "	High	HF
"	30000 to 300000 "	Very High	VHF
"	300000 to 3000000 "	Ultra High	UHF
"	3000000 to 30000000 "	Super High	SHF

This range may be extended as progress of the art warrants.

² In linear modulation the average amplitude of the envelope is equal to the amplitude of the unmodulated wave, provided there is no zero-frequency component in the modulating signal wave (as in telephony). For modulating signal waves having unequal positive and negative peaks, positive and negative modulation factors may be defined as the ratios of the maximum departures (positive and negative) of the envelope from its average value, to its average value.

§2.29 *Percentage modulation (frequency)*.—"Percentage modulation" with respect to a frequency modulated radio wave, is the ratio of the frequency difference between the fixed carrier frequency and the resultant modulated frequency and the frequency difference required for 100-percent modulation, expressed in percentage.

§2.30 *Maximum percentage modulation*.—"Maximum percentage of modulation" means the greatest percentage of modulation that may be obtained by a transmitter without producing in its output harmonics of the modulating frequency in excess of those permitted by these regulations.

§2.31 *High-level modulation*.—"High-level modulation" is modulation produced in the last radio stage of the system.

§2.32 *Low-level modulation*.—"Low-level modulation" is modulation produced in an earlier stage than the final.

§2.33 *Plate modulation*.—"Plate modulation" is modulation produced by introduction of the modulating wave into the plate circuit of any tube in which the carrier frequency wave is present.

§2.34 *Grid modulation*.—"Grid modulation" is modulation produced by introduction of the modulating wave into any of the grid circuits of any tube in which the carrier frequency wave is present.

§2.35 *Special provisions for apparatus employing alternating plate supply (self-rectifying plate supply)*.—In the application of these rules to equipment authorized and designed for the use of alternating current or voltage, as plate supply for the last radio stage, the terms "direct current" and "direct voltage" shall be considered as referring to the equivalent effective alternating current and voltage, and terms having possible application only to equipment designed for the use of direct current shall not apply whenever these terms are used in these rules.

ADMINISTRATIVE REGULATIONS

§2.41 *Period of construction*.¹—(a) Each construction permit for a radio station in the broadcast service will specify a maximum of 60 days from the date of granting thereof as the time within which construction of the station shall begin, and a maximum of six 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.

(b) Each construction permit for a radio station other than broadcast will specify the date of grant as the earliest date of commencement of construction and a maximum of eight 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.

§2.42 *Equipment test*.—Upon completion of construction of a radio station in exact accordance with the terms of the construction permit, the technical provisions of the application therefor and the rules and regulations governing the class of station concerned and prior to filing of application for license, the permittee is authorized to test the equipment for a period not to exceed 10 days: *Provided*, That:

(a) The inspector in charge of the district in which the station is located, is notified 2 days in advance of the beginning of tests.

(b) In the case of all broadcast stations the Commission also shall be notified 2 days in advance of the beginning of tests, which shall be conducted in the case of standard broadcast stations, only between 1 a.m. and 6 a.m., local standard time unless otherwise specifically authorized. Equipment tests shall not be conducted during the frequency monitoring period when the station is required to remain silent.

(c) The Commission may notify the permittee to conduct no tests or may cancel, suspend, or change the date of beginning for the period of such tests as and when such action may appear to be in the public interest, convenience, and necessity.

§2.43 *Service or program test*.—(a) When construction and equipment tests are completed in exact accordance with the terms of the construction permit, the technical provisions of the application therefor, and the rules and regulations governing the class of station concerned, and after an application for station license has been filed with the Commission showing the transmitter to be in satisfactory operating condition, the permittee is authorized to conduct service or program tests in exact accordance with the terms of the construction permit for a period not to exceed 30 days: *Provided*, That:

(1) The inspector in charge of the district in which the station is located, is notified 2 days in advance of the beginning of such tests.

(2) In the case of all broadcast stations the Commission also shall be notified 2 days in advance of the beginning of tests.

(b) The Commission reserves the right to cancel such tests or suspend, or change the date of beginning for the period of such tests as and when such action may appear to be in the public interest, convenience and necessity by notifying the permittee.

(c) Service or program tests will not be authorized after expiration date of the construction permit.

§2.44 *Authorization for tests not to be construed as license*.—The authorization for tests embodied in sections 2.42 and 2.43 shall not be construed as constituting a license to operate but as a necessary part of the construction.

§2.45 *License expiration time and periods*.—Each station license will be issued so as to expire at the hour 3 a.m., eastern standard time. The normal license periods and expiration dates are specified under the rules governing the class of station concerned. Unless otherwise ordered, when an application for a new station license is granted within three months of the expiration date for licenses of the particular class of station involved, the license shall be issued for the unexpired period of the current license term and for the full succeeding term. If granted more than three months from the normal expiration date, the license will be issued for the unexpired period of the current license term only.

§2.46 *License, simultaneous modification and renewal*.—When an application is granted by the Commission necessitating the issuance of a modified license less than 60 days prior to the expiration date of the license sought to be modified, and an application for renewal of said license is granted subsequent or prior thereto (but within 30 days of expiration of the present license) the modified license as well as the renewal license shall be issued to conform to the combined action of the Commission.

¹ See section 1.356 Rules of Practice and Procedure.

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§2.47 Maintenance tests of licensed stations.—Station licensees are authorized to carry on such routine tests as may be required for the proper maintenance of the stations under the rules governing the class of station concerned, provided that the tests shall be so conducted as not to cause interference with the service of other stations.

§2.48 Station inspection.—The licensee of any radio station shall make the station available for inspection by representatives of the Commission at any reasonable hour and under the regulations governing the class of station concerned.

§2.49 Call letter assignment.—The call letters of a radio station shall normally be designated in alphabetical order from groups available for assignment.

§2.50 Deletion of call letters.—The call letters of a radio station will be deleted in either of the following instances:

(a) Where an existing instrument of authorization has expired and no application for renewal or extension thereof has been filed;

(b) Where a license has been revoked, surrendered or canceled.

§2.51 Station license, posting of.—The original of each station license shall be posted in the transmitter room or kept in the manner specified in the regulations governing the class of station concerned.

§2.52 Operator license, posting of.—The original license of each station operator shall be posted at the place where he is on duty or kept in his possession in the manner specified in the regulations governing the class of station concerned.

§2.53 Operators, place of duty.—(a) Except as may be provided in the rules governing a particular class of station, one or more licensed operators of the grade specified by these rules and regulations shall be on duty at the place where the transmitting apparatus of each station is located and in actual charge thereof whenever it is being operated; *Provided, however, That:*

(1) Subject to the provisions of paragraph (b) of this section, in the case of a station licensed for service other than broadcast, where remote control is used, the Commission may modify the foregoing requirements upon proper application and showing being made so that such operator or operators may be on duty at the control station in lieu of the place where the transmitting apparatus is located.

(2) In the case of two or more stations, except amateur and broadcast, licensed in the name of the same person to use frequencies above 30000 kilocycles only, a licensed radio operator of any class except amateur or holder of restricted radiotelephone or radiotelegraph operator permit who has the station within his effective control, may be on duty at any point within the communication range of such stations in lieu of the transmitter location or control point during the actual operation of the transmitting apparatus and shall supervise the emissions of all such stations so as to insure the proper operation in accordance with the station license.

(3) A licensed operator who is the holder of a radiotelephone or radiotelegraph first- or second-class license may be on duty as the operator of one or more forestry stations licensed in the name of the same person, municipality, or state, at any location within the reliable daytime communication range of each such station in lieu of the transmitter locations or control point(s) during actual operation of the transmitting apparatus employing telephony; *Provided,* Such operator has each station within his effective control and supervises the emission of each station to insure proper operation thereof in accordance with the terms of the respective station license; *Provided further,* That forestry stations operated in accordance herewith shall have a maximum rated carrier power not in excess of 50 watts and shall be authorized to operate on a frequency or frequencies other than within the band 3000 to 30,000 kilocycles; *Provided further,* That the equipment thereof shall be designed and constructed so that none of the operations necessary to be performed during the course of normal rendition of service may cause off-frequency operation or result in any unauthorized radiation, and that any needed adjustments of the transmitter that may affect proper operation of the station shall be regularly made by or in the presence holding a first- or second-class license, either telephone or telegraph, who shall be responsible for the proper operation of the equipment.

(b) Authority to employ an operator at the control point in accordance with paragraph (a) (1) of this section shall be subject to the following conditions:

(1) The transmitter shall be so installed and protected that it is not accessible to other than duly authorized persons.

(2) The emissions of the transmitter shall be continuously monitored at the control point by a licensed operator of the grade specified for the class of station involved.

(3) Provision shall be made so that the transmitter can quickly and without delay be placed in an inoperative condition in the event there is a deviation from the terms of the station license.

(4) The radiation of the transmitter shall be suspended immediately when there is a deviation from the terms of the station license.

§2.54 Retention of radio station logs.—Logs of a radio station, when required elsewhere in these rules and regulation to be made or kept, shall be retained by the licensee for a period of 1 year unless otherwise provided by the rules governing the particular service or class of station concerned; *Provided, however,* That logs involving communications incident to a disaster or which include communications incident to or involved in an investigation by the Commission and concerning which the licensee has been notified, shall be retained by the licensee until specifically authorized in writing by the Commission to destroy them; *Provided, further,* That logs incident to or involved in any claim or complaint of which the licensee has notice shall be retained by the licensee until such claim or complaint has been fully satisfied or until the same has been barred by statute limiting the time for the filing of suits upon such claims.

§2.55 Logs, by whom kept.—Each log shall be kept by the person or persons competent to do so, having actual knowledge of the facts required, who shall sign the log when starting duty and again when going off duty. The logs shall be made available upon request by an authorized representative of the Commission.

§2.56 Log form.—The log shall be kept in an orderly manner, in suitable form, and in such detail that the data required for the particular class of sta-

¹ Effective control is deemed lost when a receiver or transmitter of a station becomes inoperative or operation deviates from terms of the station license, and operation of such station must be discontinued immediately.

tion concerned, are readily available. Key letters or abbreviations may be used if proper meaning or explanation is contained elsewhere in the log.

§2.57 Correction of logs.—No log or portion thereof shall be erased, obliterated, or willfully destroyed within the period of retention provided by the rules. Any necessary correction may be made only by the person originating the entry who shall strike out the erroneous portion, initial the correction made, and indicate the date of correction.

§2.58 Rough logs.—Rough logs may be transcribed into condensed form, but in such case the original log or memoranda and all portions thereof shall be preserved and made a part of the complete log.

§2.59 Distress messages.—Each station licensee shall give absolute priority to radio communications or signals relating to ships or aircraft in distress; shall cease all sending on frequencies which will interfere with hearing a radio communication or signal of distress and except when engaged in answering or aiding the ship or aircraft in distress, shall refrain from sending any radio communications or signals until there is assurance that no interference will be caused with the radio communications or signals relating thereto; and shall assist the vessel in distress, so far as possible, by complying with its instructions.

§2.60 Control of distress traffic.—The control of distress traffic shall devolve upon the mobile station in distress or upon the station which by application of the provisions of section 2.61 has sent the distress call. These stations may delegate the control of the distress traffic to another station.

§2.61 Retransmission of distress message.—Any station which becomes aware that a mobile station is in distress may transmit the distress message in the following cases:

(a) When the station in distress is not itself in a position to transmit the message.

(b) In the case of mobile stations, when the master or the person in charge of the ship, aircraft, or other vehicle carrying the station which intervenes believes that further help is necessary.

(c) In the case of other stations, when directed to do so by the station in control of distress traffic or when it has reason to believe that a distress call which it has intercepted has not been received by any station in a position to render aid.

§2.62 Resumption of operation after distress.—No station having been notified to cease operation shall resume operation on frequency or frequencies which may cause interference until notified by the station issuing the original notice that the station involved will not interfere with distress traffic as it is then being routed or until the receipt of a general notice that the need for handling distress traffic no longer exists.

§2.63 Operation during emergency.—The licensee of any station, except amateurs, may, during a period of emergency in which the normal communication facilities are disrupted as a result of hurricane, flood, earthquake, or similar disaster, utilize such station for emergency communication service in communicating in a manner other than that specified in the station license, provided (1) that as soon as possible after the beginning of such emergency use notice be sent to the Commission in Washington, D. C., and to the inspector in charge of the district in which the station is located stating the nature of the emergency and the use to which the station is being put, and (2) that the emergency use of the station shall be discontinued as soon as substantially normal communication facilities are again available and the Commission in Washington, D. C., and the inspector in charge be notified immediately when such special use of the station is terminated. The Commission may at any time order the discontinuance of such service.

§2.64 Portable-mobile station.—“Portable-mobile station” means a radio station which is normally used while in motion and which is capable of being moved conveniently from one mobile unit to another, and is in fact so moved from time to time.

§2.65 Station identification.—When not required to identify itself by some other provision or provisions of the Rules and Regulations, every radio station shall identify itself by its regularly designated call letters as follows:

1. Every station operating in the broadcast service shall transmit its call letters at the beginning and end of each period of operation, and, during operation, at least once every hour.

2. Every station used for other than broadcast service shall transmit its call letters at the end of each transmission, and at least once every fifteen minutes during an exchange of communications.

§2.66 Discontinuance of operation.—Unless otherwise required by the rules governing the particular service in which a radio station operates, the licensee of each fixed or land radio station, except stations operating in Alaska, shall notify the inspector in charge of the district where such station is located of any of the following changes in the status of such station at least two days before such change:

(a) Temporary discontinuance of operation for a period of ten days or more;

(b) The date of resumption of operation after temporary discontinuance of operation for a period of ten days or more;

(c) Permanent discontinuance of operation. *Provided, however,* Where any such discontinuance of operation is not voluntary and results from causes beyond the control of the licensee notice thereof shall be given not later than two days after such discontinuance of operation.

In all cases of permanent discontinuance of operation the licensee shall, in addition to notifying the inspector of intention to discontinue operation, immediately forward the station license to the Washington, D. C. office of the Commission for cancellation.

TECHNICAL REGULATIONS

§2.71 Allocation of frequencies.—The center frequencies of each communication band and the allocation of frequencies to the various services will be in accordance with appendix B hereof.

[Editor's Note: Appendix B, Frequency Allocations, currently being revised by the FCC, is not available at present time.]

§2.72 Classification of emissions.—Emissions shall be classified according
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to the purpose for which they are used, assuming their modulation or their possible keying to be only in amplitude as follows:¹

1. Continuous waves:

Type A0.—Waves the successive oscillations of which are identical under fixed conditions.²

Type A1.—Telegraphy on pure continuous waves. A continuous wave which is keyed according to a telegraph code.

Type A2.—Modulated telegraphy. A carrier wave modulated at one or more audible frequencies; the audible frequency or frequencies or their combination with the carrier wave being keyed according to a telegraph code.

Type A3.—Telephony: Waves resulting from the modulation of a carrier wave by frequencies corresponding to the voice, to music or to other sounds.

Type A4.—Facsimile: Waves resulting from the modulation of a carrier wave by frequencies produced at the time of the scanning of a fixed image with a view to its reproduction in a permanent form.

Type A5.—Television: Waves resulting from the modulation of a carrier wave by frequencies produced at the time of the scanning of fixed or moving objects.

2. Damped waves:

Type B.—Waves composed of successive series of oscillations the amplitude of which, after attaining a maximum, decreases gradually, the wave trains being keyed according to a telegraph code.

Communication band width.—The frequency bands authorized to be occupied by the above types of emission are as shown in the following table:

Type of transmission	Total width of the band in cycles For transmission with 2 sidebands
A-0 Continuous waves, no signaling.	
A-1 Telegraphy, pure, continuous wave: Morse code. Baudot code. Stop-start printer	Numerically equal to the telegraph speed in bauds for the fundamental frequency, 3 times this width for the 3d harmonic, etc. (For a code of 8 time elements (dots or blanks) per letter and 48 time elements per word, the speed in bands shall be equal to 0.8 times the speed in words per minute.)
Scanning-type printer	300-1000, for speeds of 50 words per minute, according to the conditions of operation and the number of lines scanned (for example, 7 or 12). Harmonics are not considered in the above values.
A-2 Telegraph modulated to musical frequency.	Figures appearing under A-1, plus twice the highest modulation frequency.
A-3 Commercial telephony Broadcasting	Twice the number indicated by the CCIF Opinions (about 6000 to 8000). ³ 15000 to 20000.
A-4 Facsimile	Approximately the ratio between the number of picture components ⁴ to be transmitted and the number of seconds necessary for the transmission.
A-5 Television	Approximately the product of the number of picture components ² multiplied by the number of pictures transmitted per second.

§2.73 Special emissions.—Authorization for other types of emission may be issued and will be termed "special" in the instrument of authorization. When special emissions are authorized they will be described and limited as to band width by the instrument of authorization.

§2.74 Permissible band width of emission.—The band width described herein is the maximum permissible for the type of emission indicated. Unless otherwise specifically provided by the rules governing the class of station concerned, the band width emitted shall not exceed the frequency separation band width as shown in the table of frequency allocations (appendix B).

§2.75 Frequency measurement.—The licensee of each station shall provide means for the measurement of the station frequency. The measurement of the station frequency shall be made by a means independent of the frequency control of the transmitter and shall be conducted in accord with the regulations governing the class of station concerned.

§2.76 Primary standard of frequency.—The primary standard of frequency for radio frequency measurements shall be the national standard of frequency maintained by the National Bureau of Standards, Department of Commerce, Washington, D. C. The operating frequency of all radio stations will be determined by comparison with this standard or the standard signals of Station WWV of the National Bureau of Standards.

§2.77 Type B emission prohibited.—No license shall be issued for the operation of any station using, or proposing to use, transmitting apparatus employing damped wave (type B) emission, except for the operations of life boat apparatus for routine tests, and emergency communications in the open sea.

§2.78 Frequency tolerance.—The frequency tolerance for various classes of stations will be as specified in the regulations governing the class of station concerned.

¹ See Article 5, Section 1 of the General Radio Regulations annexed to the International Telecommunications Convention, Madrid, 1932, Revision of Cairo, 1938.

² These waves shall be used only in special cases, such as standard frequency emissions. It is recognized that the band width may be wider for a multiple-channel radiotelephony and secret radiotelephony.

⁴ Two picture components, one black and one white, constitute a cycle; thus, the modulation frequency equals one-half the number of components transmitted per second.

§2.79 Operating power, computation of.—The operating power shall be computed by one of the following methods:

(a) By indirect measurement from the plate input power of the last radio stage, by multiplying the plate voltage by the total plate current of the last radio stage, and by a factor which is specified in the regulations governing the class of station concerned.

(b) By direct measurement of the antenna input power.

(c) By measurements of field intensity as specified by the regulations governing the class of station concerned.

§2.80 Operating power tolerance.—The operating power of all radio stations shall be maintained within the following tolerance of the authorized or licensed power:

(a) When the maximum power only is specified, the operating power shall not be greater than necessary to carry on the service and in no event more than 5 percent above the maximum power specified.

(b) Identification announcements during operation need not be made when to make such announcement would interrupt a single consecutive speech, play, or, any type of production. In such cases the identification announcement shall be made at the first interruption of the entertainment continuity and at the conclusion thereof.

§2.81 Changes in height or location of antenna.—The licensee of a radio station, the transmitter of which is authorized at a fixed location, shall not make any changes, without the express authority of the Commission, either in the height or the location of the antenna or its supporting structures, except, in case of other than broadcast station when the existing or proposed antenna or structure has a maximum height not in excess of 100 feet above the ground, changes in height or local changes in location may be made without specific authorization. In no case shall any change in the height or the location of the antenna or its supporting structures be made without authority when located or proposed to be located within five miles of an airport recognized by the Civil Aeronautics Administration or within five miles of the center line of an established Federal airway.

§2.82 Inspection of tower lights and associated control equipment.—The licensee of any radio station which has an antenna or antenna supporting structure(s) required to be illuminated pursuant to the provisions of section 303(q) of the Communications Act of 1934, as amended:

(a) Shall make a visual observation of the tower lights at least once each twenty-four hours to insure that all such lights are functioning properly as required.

(b) Shall report immediately by telephone or telegraph to the nearest Airways Communication Station or Office of the Civil Aeronautics Administration any observed failure of the tower lights, not corrected within thirty minutes, regardless of the cause of such failure. Further notification by telephone or telegraph shall be given immediately upon resumption of the required illumination.

(c) Shall inspect at intervals of at least once each three months, all flashing or rotating beacons and automatic lighting control devices to insure that such apparatus is functioning properly as required.

NATIONAL DEFENSE

§2.91 National defense—free service.—Any common carrier subject to the Communications Act may render to any agency of the United States Government free service in connection with the preparation for the national defense. Every such carrier rendering any such free service shall make and file, in duplicate, with the Commission, on or before the 31st day of July and on or before the 31st day of January in each year, reports covering the periods of six months ending on the 30th day of June and the 31st day of December, respectively, next prior to said dates. These reports shall show the names of the agencies to which free service was rendered pursuant to this rule, the general character of the communications handled for each agency, and the charges in dollars which would have accrued to the carrier for such service rendered to each agency if charges for all such communications had been collected at the published tariff rates.

§2.92 National defense—emergency authorization.—The Federal Communications Commission may authorize the licensee of any radio station during a period of national emergency to operate its facilities upon such frequencies, with such power and points of communication, and in such a manner beyond that specified in the station license as may be requested by the Army or Navy.

§2.93 National defense—naval instructions regarding ship radio service.—No provision of the Commission's rules and regulations shall, in time of war, prevent the master of any vessel of the United States from taking any action whatsoever in regard to the radio installation, the operators, the transmission and receipt of messages, and the radio service of the ship whenever in his discretion such action is necessary to carry out the instructions of United States naval control officers and other instructions issued by the Navy Department.

Part 3—RULES GOVERNING STANDARD AND HIGH-FREQUENCY BROADCAST STATIONS

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3.421 General requirements.
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3.423 Rates and practices.
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Subpart A—Rules Governing Standard Broadcast Stations

DEFINITIONS¹

§3.1 Standard broadcast station.—The term "standard broadcast station" means a station licensed for the transmission of radio-telephone emissions primarily intended to be received by the general public and operated on a channel in the band 550-1600 kilocycles, inclusive.

§3.2 Standard broadcast band.—The term "standard broadcast band" means the band of frequencies extending from 550-1600 kilocycles, inclusive, both 550 kilocycles and 1600 kilocycles being the carrier frequencies of broadcast channels.

§3.3 Standard broadcast channel.—The term "standard broadcast channel" means the band of frequencies occupied by the carrier and two side bands of a broadcast signal with the carrier frequency at the center. Channels shall be designated by their assigned carrier frequencies. Carrier frequencies assigned to standard broadcast stations shall begin at 550 kilocycles and be in successive steps of 10 kilocycles.

§3.4 Dominant station.—The term "dominant station" means a class I station, as hereinafter defined, operating on a clear channel.

§3.5 Secondary station.—The term "secondary station" means any station except a class I station operating on a clear channel.

§3.6 Daytime.—The term "daytime" means that period of time between local sunrise and local sunset.

§3.7 Nighttime.—The term "nighttime" means that period of time between local sunset and 12 midnight local standard time.

§3.8 Sunrise and sunset.—The terms "sunrise and sunset" mean, for each particular location and during any particular month, the average time of sunrise and sunset as specified in the license of a broadcast station. (For tabulation of average sunrise and sunset times for each month at various points in the United States, see "Average Sunrise and Sunset Times.")

§3.9 Broadcast day.—The term "broadcast day" means that period of time between local sunrise and 12 midnight local standard time.

§3.10 Experimental period.—The term "experimental period" means that time between 12 midnight and local sunrise. This period may be used for experimental purposes in testing and maintaining apparatus by the licensee of any standard broadcast station on its assigned frequency and with its authorized power, provided no interference is caused to other stations maintaining a regular operating schedule within such period. No station licensed for "daytime" or "specified hours" of operation may broadcast any regular or scheduled program during this period.

§3.11 Service areas.—(a) The term "primary service area" of a broadcast station means the area in which the ground wave is not subject to objectionable interference or objectionable fading.

(b) The term "secondary service area" of a broadcast station means the area served by the sky wave and not subject to objectionable interference. The signal is subject to intermittent variations in intensity.

(c) The term "intermittent service area" of a broadcast station means the area receiving service from the ground wave but beyond the primary service area and subject to some interference and fading.

§3.12 Main studio.—The term "main studio" means, as to any station, the studio from which the majority of its local programs originate, and/or from which a majority of its station announcements are made of programs originating at remote points.

§3.13 Portable transmitter.—The term "portable transmitter" means a transmitter so constructed that it may be moved about conveniently from place to place, and is in fact so moved about from time to time, but not ordinarily used while in motion. In the standard broadcast band, such a transmitter is used in making field intensity measurements for locating a transmitter site for a standard broadcast station. A portable broadcast station will not be licensed in the standard broadcast band for regular transmission of programs intended to be received by the public.

§3.14 Auxiliary transmitter.—The term "auxiliary transmitter" means a transmitter maintained only for transmitting the regular programs of a station in case of failure of the main transmitter.

§3.15 Combined audio harmonics.—The term "combined audio harmonics" means the arithmetical sum of the amplitudes of all the separate harmonic components. Root sum square harmonic readings may be accepted under conditions prescribed by the Commission.

§3.16 Effective field.—The term "effective field" or "effective field intensity" is the root-mean-square (RMS) value of the inverse distance fields at a distance of 1 mile from the antenna in all directions in the horizontal plane.

ALLOCATION OF FACILITIES

§3.21 Three classes of standard broadcast channels.—(a) *Clear channel:* A "clear channel" is one on which the dominant station or stations render service over wide areas and which are cleared of objectionable interference within their primary service areas and over all or a substantial portion of their secondary service areas.

(b) *Regional channel:* A "regional channel" is one on which several stations may operate with powers not in excess of 5 kilowatts. The primary service area of a station operating on any such channel may be limited, as a consequence of interference to a given field intensity contour.

(c) *Local channel:* A "local channel" is one on which several stations may operate with powers not in excess of 250 watts. The primary service area of a station operating on any such channel may be limited, as a consequence of interference, to a given field intensity contour.

¹ Other definitions which may pertain to standard broadcast stations are included in sections 2.1 to 2.35 and the Communications Act of 1934, as amended.

§3.22 Classes and power of standard broadcast stations.—(a) *Class I station:* A "class I station" is a dominant station operating on a clear channel and designed to render primary and secondary service over an extended area and at relatively long distances. Its primary service area is free from objectionable interference from other stations on the same and adjacent channels and its secondary service area free from interference except from stations on the adjacent channel, and from stations on the same channel in accordance with the channel designation in section 3.25 or in accordance with the Engineering Standards of Allocation. The operating power shall be not less than 10 kilowatts nor more than 50 kilowatts. (Also see section 3.25 (a) for further power limitation.)

(b) *Class II station:* A "class II station" is a secondary station which operates on a clear channel (see section 3.25) and is designed to render service over a primary service area which is limited by and subject to such interference as may be received from class I stations. A station of this class shall operate with power not less than 0.25 kilowatts nor more than 50 kilowatts. Whenever necessary, a class II station shall use a directional antenna or other means to avoid interference with class I stations and with other class II stations, in accordance with the Engineering Standards of Allocation.

(c) *Class III station:* A "class III station" is a station which operates on a regional channel and is designed to render service primarily to a metropolitan district^{1a} and the rural area contiguous thereto. Class III stations are subdivided into two classes:

(1) *Class III-A station:* A "class III-A station" is a class III station which operates with power not less than 1 kilowatt nor more than 5 kilowatts, and the service area of which is subject to interference in accordance with the Engineering Standards of Allocation.

(2) *Class III-B station:* A "class III-B station" is a class III station which operates with a power not less than 0.5 kilowatt nor more than 1 kilowatt night and 5 kilowatts daytime, and the service area of which is subject to interference in accordance with the Engineering Standards of Allocation.

(d) *Class IV station:* A "class IV station" is a station operating on a local channel and designed to render service primarily to a city or town and the suburban and rural areas contiguous thereto. The power of a station of this class shall not be less than 0.1 kilowatt nor more than 0.25 kilowatt, and its service area is subject to interference in accordance with the Engineering Standards of Allocation.

§3.23 Time of operation of the several classes of stations.²—The several classes of standard broadcast stations may be licensed to operate in accordance with the following:

(a) "Unlimited time" permits operation without a maximum limit as to time.

(b) "Limited time" is applicable to class II (secondary stations) operating on a clear channel only. It permits operation of the secondary station during daytime, and until local sunset if located west of the dominant station on the channel, or if located east thereof, until sunset at the dominant station; and in addition during night hours, if any, not used by the dominant station or stations on the channel.

(c) "Daytime" permits operation during the hours between average monthly local sunrise and average monthly local sunset. (For exact time of sunset at any location see "Average Sunrise and Sunset Times.")

(d) "Sharing time" permits operation during hours which are so restricted by the station license as to require a division of time with one or more other stations using the same channel.

(e) "Specified hours" means that the exact operating hours are specified in the license. (The minimum hours that any station shall operate are specified in section 3.71.)

§3.24 Broadcast facilities; showing required.—An authorization for a new standard broadcast station or increase in facilities of an existing station³ will be issued only after a satisfactory showing has been made in regard to the following, among others:

(a) That the proposed assignment will tend to effect a fair, efficient, and equitable distribution of radio service among the several states and communities.

(b) That objectionable interference will not be caused to existing stations or that if interference will be caused the need for the proposed service outweighs the need for the service which will be lost by reason of such interference. That the proposed station will not suffer interference to such an extent that its service would be reduced to an unsatisfactory degree. (For determining objectionable interference, see Engineering Standards of Allocation and Field Intensity Measurements in Allocation.)

(c) That the applicant is financially qualified to construct and operate the proposed station.⁴

(d) That the applicant is legally qualified. That the applicant (or the person or persons in control of an applicant corporation or other organization) is of good character and possesses other qualifications sufficient to provide a satisfactory public service.

(e) That the technical equipment proposed, the location of the transmitter, and other technical phases of operation comply with the regulations governing the same, and the requirements of good engineering practice. (See technical regulations herein and Locations of Transmitters of Standard Broadcast Stations.)

(f) That the facilities sought are subject to assignment as requested under

^{1a} The term "metropolitan district" as used in this paragraph is not limited in accordance with the definition given by the Bureau of the Census but includes any principal center of population in any area.

² Formal application required for change in time of operation of existing broadcast station.

See Standards of Good Engineering Practice for form number.

³ Formal applications required. See Standards of Good Engineering Practice for form number.

⁴ See Money Required to Construct and Complete Electrical Tests of Stations of Different Classes and Powers.

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existing international agreements and the Rules and Regulations of the Commission.

(g) That the public interest, convenience, and necessity will be served through the operation under the proposed assignment.

§3.25 Clear channel: class I and II stations.—The frequencies in the following tabulation are designated as clear channels and assigned for use by the classes of stations are given:

(a) To each of the channels below there will be assigned one class I station and there may be assigned one or more class II stations operating limited time or daytime only: 640, 650, 660, 670, 700, 720, 750, 760, 770, 780, 820, 830, 840, 870, 880, 890, 1020, 1040, 1100, 1120, 1160, 1180, 1200, and 1210 kilocycles. The power of the class I stations on these channels shall not be less than 50 kilowatts.

(b) To each of the channels below there may be assigned class I and class II stations: 680, 710, 810, 850, 940, 1000, 1030, 1060, 1070, 1080, 1090, 1110, 1130, 1140, 1170, 1190, 1500, 1510, 1520, 1530, 1550, and 1560 kilocycles.

(c) For class II stations located not less than 650 miles from the nearest Canadian Border and which will not deliver over 5 microvolts per meter ground wave or 25 microvolts per meter 10 per cent time sky wave at any point on said border, 690, 740, 860, 990, 1010,^{4a} and 1580 kilocycles.

(d) For class II stations which operate daytime only with power not in excess of 1 kilowatt and which will not deliver over 5 microvolts per meter ground wave at any point on the nearest Mexican Border, 730, 800, 900, 1050,^{4b} 1220,^{4c} and 1570 kilocycles.

(e) For class II stations located not less than 650 miles from the nearest Cuban Border and which will not deliver over 5 microvolts per meter ground wave or 25 microvolts per meter 10 per cent time sky wave at any point on said border, 1540 kilocycles.

§3.26 Regional channels: classes III-A and III-B stations.—The following frequencies are designated as regional channels and are assigned for use by class III-A and III-B stations:^{4a} 550, 560,^{4b} 570,^{4c} 580, 590,^{4d} 600, 610, 620, 630,^{4e} 790, 910, 920, 930, 950, 960, 970, 980, 1150, 1250, 1260, 1270,^{4f} 1280, 1290, 1300, 1310, 1320, 1330, 1350, 1360, 1370, 1380, 1390, 1410, 1420, 1430, 1440, 1460, 1470, 1480, 1590, and 1600 kilocycles.

§3.27 Local channels: class IV stations.—The following frequencies are designated as local channels and are assigned for use by class IV stations: 1230, 1240, 1340, 1400, 1450, and 1490 kilocycles.

§3.28 Assignment of stations to channels.—(a) The individual assignments of stations to channels which may cause interference to other United States stations only shall be made in accordance with the standards of good engineering practice prescribed and published from time to time by the Commission for the respective classes of stations involved. (For determining objectionable interference see "Engineering Standards of Allocation" and "Field Intensity Measurements in Allocation", Section C.)

(b) In all cases where an individual station assignment may cause interference with or may involve a channel assigned for priority of use by a station in another North American country, the classifications, allocation requirements and engineering standards set forth in the North American Regional Broadcasting Agreement shall be observed.

§3.29 Assignment of class IV stations to regional channels.—On condition that interference will not be caused to any class III station, and that the channel is used fully for class III stations and subject to interference as may be received from class III stations, class IV stations may be assigned to regional channels.

§3.30 Station location.—(a) Each standard broadcast station shall be considered located in the State and city where the main studio is located.

(b) The transmitter of each standard broadcast station shall be so located that primary service is delivered to the borough or city in which the main studio is located in accordance with the Standards of Good Engineering Practice, prescribed by the Commission.

§3.31 Authority to move main studio.—The licensee of a standard broadcast station shall not move its main studio outside the borders of the borough or city, State, district, Territory, or possession in which it is located without first making written application⁵ to the Commission for authority to so move, and securing written permission for such removal. The licensee shall promptly notify the Commission of any other change in location of the main studio.

§3.32 Special experimental authorizations.—(a) Special experimental authorizations⁷ may be issued to the licensee of a standard broadcast station in addition to the regular license upon proper application therefor⁶ and satisfactory showing in regard to the following, among others:

(1) That the applicant has a program of research and experimentation which indicates reasonable promise of contribution to the development and practical application of broadcasting, and will be in addition to and advancement of the work that can be accomplished under its regular license.

(2) That the experimental operation and experimentation will be under the direct supervision of a qualified engineer with an adequate staff of engineers qualified to carry on the program of research and experimentation.

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

(b)⁸ In case a special experimental authorization permits additional hours of operation, no licensee shall transmit any commercial or sponsored program or make any commercial announcement during such time of operation. In case of other additional facilities, no additional charge shall be made by reason of transmission with such facilities.

^{4a} A station on 1010 kilocycles shall also protect a class I-B station at Havana, Cuba.
^{4b} See North American Regional Broadcasting Agreement for use of this channel by a station in New York (Appendix I Table IV.)

^{4c} See Agreement with Mexico for further use of this channel.

^{4d} See section 3.29 in regard to assigning class IV stations to regional channels.

^{4e} See North American Regional Broadcasting Agreement for special provisions concerning the assigning of class II stations in other countries of North America to these regional channels. Such stations shall be protected from interference in accordance with appendix II, Table I, of said Agreement.

⁵ Formal application required. See Standards of Good Engineering Practice for form number.

⁷ Special authorizations which do not involve experimental operation may be granted pursuant to section 1.365.

⁸ The Commission on September 24, 1940, advanced the effective date of section 3.32(b) to March 29, 1941.

(c) A special experimental authorization will not be extended after the actual experimentation is concluded.

(d) The program of research and experimentation as outlined in the application for a special experimental authorization shall be adhered to in the main unless the licensee is authorized to do otherwise by the Commission.

(e) The Commission may require from time to time a broadcast station holding such experimental authorization to conduct experiments that are deemed desirable and reasonable.

(f) A supplemental report shall be filed with and made a part of each application for an extension of a special experimental authorization and shall include statements of the following:

(1) Comprehensive summary of all research and experimentation conducted.

(2) Conclusions and outline of proposed program for further research and development.

(3) Comprehensive summary and conclusions as to the social and economic effects of its use.

§3.33 Directional antenna; showing required.—(a) No application for authority to install a directional antenna⁹ will be accepted unless a definite site and full details of the design of the directional antenna are given with the application. (See Data Required with Applications Involving Directional Antenna Systems.)

(b) No application for an authorization to operate a directional antenna during the broadcast day will be accepted unless proof of performance of the directional antenna taken during equipment test period is submitted with the application. (See Field Intensity Measurements in Allocation, section B.)

§3.34 Normal license period.—All standard broadcast station licenses will be issued for a normal license period of 3 years. Licenses will be issued to expire at the hour of 3 a.m., Eastern Standard Time, in accordance with the following schedule, and at three-year intervals thereafter:

(a) For stations operating on the frequencies 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 940 kc., Nov. 1, 1946.

(b) For stations operating on the frequencies 990, 1000, 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100, 1110, 1120, 1130, 1140, 1160, 1170, 1180, 1190, 1200, 1210, 1220, 1500, 1510, 1520, 1530, 1540, 1550, 1560, 1570, 1580 kc., May 1, 1945.

(c) For stations operating on the frequencies 550, 560, 570, 580, 590, 600, 610, 620, 630, 790 kc., May 1, 1946.

(d) For stations operating on the frequencies 910, 920, 930, 950, 960, 970, 980, 1150, 1250 kc., May 1, 1947.

(e) For stations operating on the frequencies 1260, 1270, 1280, 1290, 1300, 1310, 1320, 1330, 1350, 1360 kc., Nov. 1, 1945.

(f) For stations operating on the frequencies 1370, 1380, 1390, 1410, 1420, 1430, 1440, 1460, 1470, 1480, 1590, 1600 kc., Nov. 1, 1947.

(g) For stations operating on the frequency 1230 kc., Feb. 1, 1946.

(h) For stations operating on the frequency 1240 kc., Aug. 1, 1946.

(i) For stations operating on the frequency 1340 kc., Feb. 1, 1947.

(j) For stations operating on the frequency 1400 kc., Aug. 1, 1947.

(k) For stations operating on the frequency 1450 kc., Feb. 1, 1948.

(l) For stations operating on the frequency 1490 kc., Aug. 1, 1948.

§3.35 Multiple Ownership^{9a}—No license shall be granted for a standard broadcast station, directly or indirectly owned, operated or controlled^{9b} by any person^{9c} where such station renders or will render primary service to a substantial portion of the primary service area of another standard broadcast station, directly or indirectly owned, operated or controlled by such person, except upon a showing that public interest, convenience and necessity will be served through such multiple ownership situation.

EQUIPMENT

§3.41 Maximum rated carrier power; tolerances.—The maximum rated carrier power of a standard broadcast transmitter shall not be less than the authorized power nor shall it be greater than the value specified in the following table:

⁹ Formal application required. See Standards of Good Engineering Practice for form number.

^{9a} See Order 34-A, dated November 23, 1943: "This regulation is to take effect immediately, PROVIDED, HOWEVER That with respect to persons who now directly or indirectly own, operate or control a standard broadcast station which renders primary service to a substantial portion of the primary service area of another standard broadcast station, directly or indirectly owned, operated or controlled by such person, the effective date of this regulation shall be midnight May 31, 1944; PROVIDED FURTHER, That with respect to such persons the Commission may, upon proper showing, extend the licenses of the stations involved in order, in any particular case, to determine the applicability of this regulation or to permit the orderly disposition of properties."

The Commission on April 4, 1944 adopted Order 84-B which provides:

"I. Except as provided below the effective date of Regulation 3.35 is hereby suspended. II. On or before May 31, 1944, all licensees to whom Regulation 3.35 is or may be applicable will be required to:

1. File an application which will effect compliance with Regulation 3.35; or
2. Submit a petition for extension of license for such period as may be necessary to complete negotiations for an orderly disposition or otherwise to comply with the terms of the Regulation provided such petition sets forth:

a. The determination of the licensee to proceed in good faith as expeditiously as may be to effectuate compliance with the Regulation; and

b. A statement of the steps which petitioner proposes to take in order to effect his compliance with the Regulation, and the specific facts establishing due diligence in the effort to effect a compliance with the terms of the Regulation and the licensee's inability to comply therewith; or

3. Submit a petition for a hearing to determine the applicability of regulation 3.35 to the petitioner, in which case the petition and the license renewal will be set for hearing.

III. The license renewals of all affected licensees, who do not take one of the foregoing steps or who are unsuccessful in obtaining an extension of time under subparagraph 2 above, will be designated for hearing.

IV. The Commission will insist upon a speedy determination of any proceeding hereunder and will require an expeditious compliance with its final order thereon within such reasonable time as may be fixed in such final order.

V. Upon compliance with Regulation 3.35 the Commission will issue appropriate certificates pursuant to the provisions of Section 123 of the Revenue Act of 1943."

^{9b} The word "control", as used herein, is not limited to majority stock ownership but includes actual working control in whatever manner exercised.

^{9c} The word "person", as used herein, includes all persons under common control.

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Class of station	Maximum power authorized to station	Maximum rated carrier power permitted to be installed ¹
		Watts
Class IV	100 or 250 watts	250
Class III	500 or 1,000 watts	1,000
	5,000 watts	5,000
Class II	250, 500, or 1,000 watts	1,000
	5,000 or 10,000 watts	10,000
	25,000 or 50,000 watts	50,000
Class I	10,000 watts	10,000
	25,000 or 50,000 watts	50,000

¹ The maximum rated carrier power must be distinguished from the operating power (see Sections 2.18 and 2.19.)

§3.42 Maximum rated carrier power; how determined.—The maximum rated carrier power of a standard broadcast transmitter shall be determined as the sum of the applicable power ratings of the vacuum tubes employed in the last radio stage.

(a) The power rating of vacuum tubes shall apply to transmitters employing the different classes of operation or systems of modulation as specified in Power Rating of Vacuum Tubes prescribed by the Commission.

(b) If the maximum rated carrier power of any broadcast transmitter, as determined by paragraph (a) of this section, does not give an exact rating as recognized in the Commission's plan of allocation, the nearest rating thereto shall apply to such transmitter.

(c) Authority will not be granted to employ, in the last radio stage of a standard broadcast transmitter, vacuum tubes from a manufacturer or of a type number not listed until the manufacturer's rating for the class of operation or system of modulation is submitted to and approved by the Commission. These data must be supplied by the manufacturer in accordance with Requirements for the Approval of the Power Rating of Vacuum Tubes, prescribed by the Commission.

§3.43 Changes in equipment; authority for.—No licensee shall change, in the last radio stage, the number of vacuum tubes to vacuum tubes of different power rating or class of operation, nor shall it change system of modulation without the authority of the Commission.¹⁰

§3.44 Other changes in equipment.—Other changes except as provided for in these rules or Standards of Good Engineering Practice, prescribed by the Commission, which do not affect the maximum power rating or operating power of the transmitter or the operation or precision of the frequency control equipment may be made at any time without authority of the Commission, but in the next succeeding application for renewal of license such changes which affect the information already on file shall be shown in full.

§3.45 Radiating system.—(a) All applicants for new, additional, or different broadcast facilities and all licensees requesting authority to move the transmitter of an existing station shall specify a radiating system the efficiency of which complies with the requirements of good engineering practice for the class and power of the station. (Also see Use of Common Antenna by Standard Broadcast Stations or Another Radio Station.)

(b) The Commission will publish from time to time specifications deemed necessary to meet the requirements of good engineering practice. (See Minimum Antenna Heights or Field Intensity Requirements and Field Intensity Measurements in Allocation, sec. A.)

(c) No broadcast station licensee shall change the physical height of the transmitting antenna, or supporting structures, or make any changes in the radiating system which will measurably alter the radiation patterns, except upon written application to and authority from the Commission.¹¹

(d) The antenna and/or supporting structure shall be painted and illuminated in accordance with the specifications supplied by the Commission pursuant to section 303 (g) of the Communications Act of 1934, as amended. (See Standard Lamps and Paints.)

(e) The simultaneous use of a common antenna or antenna structure by two standard broadcast stations or by a standard broadcast station and a station of any other class or service will not be authorized unless both stations are licensed to the same licensee. (See Use of Common Antenna by Standard Broadcast Stations or Another Radio Station.)

§3.46 Transmitter.—(a) The transmitter proper and associated transmitting equipment of each broadcast station shall be designed, constructed, and operated in accordance with the Standards of Good Engineering Practice in all phases not otherwise specifically included in these regulations.

(b) The transmitter shall be wired and shielded in accordance with good engineering practice and shall be provided with safety features in accordance with the specifications of article 810 of the current National Electrical Code as approved by the American Standards Association.

(c) The station equipment shall be so operated, tuned, and adjusted that emissions are not radiated outside the authorized band¹² which cause or which, in accordance with the Standards of Good Engineering Practice, are considered as being capable of causing interference to the communications of other stations. The spurious emissions, including radio frequency harmonics and audio frequency harmonics, shall be maintained at as low level as required by good engineering practice. The audio distortion, audio frequency range, carrier hum, noise level, and other essential phases of the operation which control the external effects shall at all times conform to the requirements of good engineering practice.

(d) Whenever, in this section, the term "good engineering practice" is used, the specifications deemed necessary to meet the requirements thereof will be published from time to time. (See Construction, General Operation and Safety of Life Requirements.)

¹⁰ Formal application required. See Standards of Good Engineering Practice for form number.

¹¹ Informal application may be made, except in controversial cases or directional antenna; then formal application shall be made.

¹² See Construction, General Operation and Safety of Life Requirements.

TECHNICAL OPERATION

§3.51 Operating power; how determined.—The operating power of each standard broadcast station shall be determined by:

(a) Direct measurement of the antenna power in accordance with section 3.54.¹³

(1) Each new standard broadcast station.

(2) Each existing standard broadcast station after June 1, 1941.

(b) Indirect measurement by means of the plate input power to the last radio stage on a temporary basis in accordance with sections 3.52 and 3.53.

(1) In the case of existing standard broadcast stations and pending compliance with paragraph (a) (2) of this section.

(2) In case of an emergency where the licensed antenna has been damaged or destroyed by storm or other cause beyond the control of the licensee or pending completion of authorized change¹⁴ in the antenna system.

(c) Upon making any change¹⁵ in the antenna system, or in the antenna current measuring instruments, or any other change which may change the characteristics of the antenna, the licensee shall immediately make a new determination of the antenna resistance (see section 3.54) and shall submit application for authority to determine power by the direct method on the basis of the new measurements.

§3.52 Operating power; indirect measurement.^{14a}—The operating power determined by indirect measurement from the plate input power of the last radio stage is the product of the plate voltage (E_p), the total plate current of the last radio stage (I_p), and the proper factor (F) given in the following tables: that is

OPERATING POWER $E_p \times I_p \times F$

A. Factor to be used for stations employing plate modulation in the last radio stage¹

	Factor (F) to be used in determining the operating power from the plate input power
Maximum rated carrier power of transmitter: ²	
100-1,000 watts	.70
5,000 and over watts	.80

B. Factor to be used for stations of all powers using low level modulation¹

	Factor (F) to be used in determining the operating power from the plate input power
Class of power amplifier in the last radio stage:	
Class B	.35
Class BC ³	.65

C. Factors to be used for stations of all powers employing grid modulation in the last radio stage¹

	Factor (F) to be used in determining the operating power from the plate input power
Type of tube in the last radio stage:	
Table C ¹	.25
Table D ¹	.35

¹ See Power Rating of Vacuum Tubes.

² The maximum-rated carrier power must be distinguished from the operating power. (See sections 2.18 and 2.19.)

³ All linear amplifier operation where efficiency approaches that of class C operation.

§3.53 Application of efficiency factors.—In computing operating power by indirect measurement the above factors shall apply in all cases, and no distinction will be recognized due to the operating power being less than the maximum rated carrier power. (See Plate Efficiency of Last Radio Stage.)

§3.54 Operating power; direct measurement.—The antenna input power determined by direct measurement is the square of the antenna current times the antenna resistance at the point where the current is measured and at the operating frequency. Direct measurement of the antenna input power will be accepted as the operating power of the station, provided the data on the antenna resistance measurements are submitted under oath giving detailed description of the method used and the data taken. The antenna current shall be measured by an ammeter of accepted accuracy.¹⁵ These data must be submitted to and approved by the Commission before any licensee will be authorized to operate by this method of power determination.¹⁶ The antenna ammeter shall not be changed to one of different type, maximum reading, or accuracy without the authority of the Commission. If any change is made in the antenna system or any change made which may affect the antenna system, the method of determining operating power shall be changed immediately to the indirect method. (See Further Requirements for Direct Measurements of Power.)

§3.55 Modulation.—(a) A licensee of a broadcast station will not be authorized to operate a transmitter unless it is capable of delivering satisfactorily the authorized power with a modulation of at least 85 percent. When the transmitter is operated with 85 percent modulation, not over 10 percent combined audio frequency harmonics shall be generated by the transmitter.

¹³ Program tests on equipment, including a new or different antenna system, will not be authorized unless application for authority to determine power by the direct method has been granted, or is submitted simultaneously with the application for license to cover the construction permit and the application for license will not be granted until such time as the application for direct measurement is approved.

¹⁴ Changes shall not be made except upon making proper request and obtaining approval thereof in accordance with sections 3.45 and 3.58.

^{14a} See Order No. 107 dated November 6, 1942, effective December 1, 1942, which makes certain changes in the method of determining operating constants of standard broadcast stations; and Order No. 107A, dated July 10, 1945, effective September 1, 1945, and October 1, 1945, which revokes Order No. 107 and (13) reinstates the provisions of section 3.52.

¹⁵ See Indicating Instruments pursuant to section 3.58.

¹⁶ Formal application required. See Standards of Good Engineering Practice for form number.

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(b) All broadcast stations shall have in operation a modulation monitor approved by the Commission.

(c) The operating percentage of modulation of all stations shall be maintained as high as possible consistent with good quality of transmission and good broadcast practice and in no case less than 85 percent on peaks of frequent recurrence during any selection which normally is transmitted at the highest level of the program under consideration.

(d) The Commission will, from time to time, publish the specifications, requirements for approval, and a list of approved modulation monitors. (See Approved Modulation Monitors and also Requirements for Approval of Modulation Monitors.)

§3.56 Modulation; data required.—A licensee of a broadcast station claiming a greater percentage of modulation than the fundamental design indicates can be procured shall submit full data showing the antenna input power by direct measurement and complete information, either oscillograms or other acceptable data, to show that a modulation of 85 percent or more with not over 10 percent combined audio harmonics, can be obtained with the transmitter operated at the maximum authorized power.

§3.57 Operating power; maintenance of.—The licensee of a broadcast station shall maintain the operating power of the station within the prescribed limits of the licensed power at all times except that in an emergency when, due to causes beyond the control of the licensee, it becomes impossible to operate with the full licensed power, the station may be operated at reduced power for a period of not to exceed 10 days, provided that the Commission and the Inspector in Charge¹⁷ shall be notified in writing immediately after the emergency develops. (See Operating Power Tolerance.)

§3.58 Indicating instruments.—Each broadcast station shall be equipped with suitable indicating instruments of accepted accuracy to measure the antenna current, direct plate circuit voltage, and the direct plate circuit current of the last radio stage. These indicating instruments shall not be changed or replaced, without authority of the Commission, except by instruments of the same type, maximum scale reading, and accuracy. (See Indicating Instruments Pursuant to section 3.58.)

§3.59 Frequency tolerance.—The operating frequency of each broadcast station shall be maintained within 50 cycles of the assigned frequency until January 1, 1940, and thereafter the frequency of each new station or each station where a new transmitter is installed shall be maintained within 20 cycles of the assigned frequency, and after January 1, 1942, the frequency of all stations shall be maintained within 20 cycles of the assigned frequency.

§3.60 Frequency monitor.—The licensee of each standard broadcast station shall have in operation at the transmitter a frequency monitor independent of the frequency control of the transmitter. The frequency monitor shall be approved by the Commission. It shall have a stability and accuracy of at least 5 parts per million. (See Approved Frequency Monitors and also Requirements for Approval of Frequency Monitors.)

§3.61 New equipment; restrictions.—The Commission will authorize the installation of new transmitting equipment in a broadcast station or changes in the frequency control of an existing transmitter only if such equipment is so designed that there is reasonable assurance that the transmitter is capable of maintaining automatically the assigned frequency within the limits specified in section 3.59.

§3.62 Automatic frequency control equipment; authorization required.—New automatic frequency control equipment and changes in existing automatic frequency control equipment that may affect the precision of frequency control or the operation of the transmitter shall be installed only upon authorization¹⁸ from the Commission. (See Approved Equipment.)

§3.63 Auxiliary transmitter.—Upon showing that a need exists for the use of an auxiliary transmitter¹⁹ in addition to the regular transmitter of a broadcast station, a license therefor may be issued provided that:

(a) An auxiliary transmitter may be installed either at the same location as the main transmitter or at another location.

(b) A licensed operator shall be in control whenever an auxiliary transmitter is placed in operation.

(c) The auxiliary transmitter shall be maintained so that it may be put into immediate operation at any time for the following purposes:

(1) The transmission of the regular programs upon the failure of the main transmitter

(2) The transmission of regular programs during maintenance or modification²⁰ work on the main transmitter, necessitating discontinuance of its operation for a period not to exceed five days.

(3) Upon request by a duly authorized representative of the Commission.

(d) The auxiliary transmitter shall be tested at least once each week to determine that it is in proper operating condition and that it is adjusted to the proper frequency, except that in case of operation in accordance with paragraph (c) of this section during any week, the test in that week may be omitted provided the operation under paragraph (c) is satisfactory. A record shall be kept of the time and result of each test operating under paragraph (c). Tests shall be conducted only between midnight and 9 a.m., local standard time.

(e) The auxiliary transmitter shall be equipped with satisfactory control equipment which will enable the maintenance of the frequency emitted by the station within the limits prescribed by these regulations.

(f) An auxiliary transmitter which is licensed at a geographical location different from that of the main transmitter shall be equipped with a frequency control which will automatically hold the frequency within the limits prescribed

by these regulations without any manual adjustment during operation or when it is being put into operation.

(g) The operating power of an auxiliary transmitter may be less than the authorized power, but in no event shall it be greater than such power.

§3.64 Alternate main transmitters.—The licensee of a standard broadcast station may be licensed for alternate main transmitters provided that a technical need²¹ for such alternate transmitters is shown and that the following conditions are met:

(a) Both transmitters are located at the same place.

(b) The transmitters have the same power rating except at stations operating with different daytime and nighttime power when it shall be permissible to employ transmitters of power ratings appropriate to either the licensed daytime or nighttime power.

(c) The external effects from both transmitters are substantially the same as to frequency stability, reliability of operation, radio harmonics and other spurious emissions, audio frequency range and audio harmonic generation in the transmitter.

OPERATION

§3.71 Minimum operating schedule.^{22a}—Except Sundays, the licensee of each standard broadcast station shall maintain a minimum operating schedule of two-thirds of the total hours that it is authorized to operate between 6 a.m. and 6 p.m., local standard time, and two-thirds of the total hours it is authorized to operate between 6 p.m. and midnight, local standard time, except that in an emergency when, due to causes beyond the control of the licensee, it becomes impossible to continue operating, the station may cease operation for a period of not to exceed 10 days, provided that the Commission and the inspector in charge²² shall be notified in writing immediately after the emergency develops.

§3.72 Operation during experimental period.—The licensee of each standard broadcast station shall operate or refrain from operating its station during the experimental period as directed by the Commission in order to facilitate frequency measurement or for the determination of interference. (Stations involved in the after-midnight frequency monitoring programs are notified of their operating and silent schedule.)

§3.73 Specified hours.—If the license of a station specifies the hours of operation, the schedule so specified shall be adhered to except as provided in sections 3.71 and 3.72.

§3.74 Sharing time.—If the licenses of stations authorized to share time do not specify hours of operation, the licensees shall endeavor to reach an agreement for a definite schedule of periods of time to be used by each. Such agreement shall be in writing and each licensee shall file the same in triplicate original with each application to the Commission for renewal of license. If and when such written agreements are properly filed in conformity with this section the file mark of the Commission will be affixed thereto, one copy will be retained by the Commission, one copy forwarded to the inspector in charge, and one copy returned to the licensee to be posted with the station license and considered as a part thereof. If the license specifies a proportionate time division, the agreement shall maintain this proportion. If no proportionate time division is specified in the license, the licensees shall agree upon a division of time. Such division of time shall not include simultaneous operation of the stations unless specifically authorized by the terms of the license.

§3.75 Sharing time; equivalence of day and night hours.—For the purpose of determining the proportionate division of time of the broadcast day for sharing time stations 1 night hour shall be considered the equivalent of 2 day hours.

§3.76 Sharing time; experimental period.—If the license of a station authorized to share time does not specify the hours of operation, the station may be operated for the transmission of regular programs during the experimental period provided an agreement thereto is reached with the other stations with which the broadcast day is shared and further provided such operation is not in conflict with section 3.72. Time-sharing agreements for operation during the experimental period need not be submitted to the Commission.

§3.77 Sharing time; departure from regular schedule.—A departure from the regular operating schedule set forth in a time-sharing agreement will be permitted only in cases where an agreement to that effect is reduced to writing, is signed by the licensees of the stations affected thereby and filed in triplicate by each licensee with the Commission prior to the time of the proposed change. If time is of the essence, the actual departure in operating schedule may precede the actual filing of written agreement, provided appropriate notice is sent to the Commission and the Inspector in Charge.²³

§3.78 Sharing time stations; notification to Commission.—If the licensees of stations authorized to share time are unable to agree on a division of time, the Commission shall be so notified by statement to that effect filed with the applications for renewals of licenses. Upon receipt of such statement the Commission will designate the applications for a hearing and, pending such hearing, the operating schedule previously adhered to shall remain in full force and effect.

§3.79 License to specify sunrise and sunset hours.—If the licensee of a broadcast station is required to commence or cease operation of the station at the time of sunrise or sunset, the license will specify the hour of the day during each month of the license period when operation of such station will commence or cease. (See Average Sunrise and Sunset Time.)

§3.80 Secondary station; filing of operating schedule.—The licensee of a secondary station authorized to operate limited time and which may resume operation at the time the dominant station (or stations) on the same channel ceases operation shall, with each application for renewal of license, file in triplicate a copy of its regular operating schedule, bearing a signed notation by the

¹⁷ See Field Offices of the Commission.

¹⁸ Formal application required. See Standards of Good Engineering Practice for form number.

¹⁹ All regulations as to safety requirements and spurious emissions applying to broadcast transmitting equipment shall apply also to an auxiliary transmitter. (See Use of Frequency and Modulation Monitors at Auxiliary Transmitter.)

²⁰ This includes the equipment changes which may be made without authority as set forth elsewhere in the Rules and Regulations and the Standards of Good Engineering Practice or as authorized by the Commission by letter or by construction permit. Where such operation is required for periods in excess of 5 days, request therefor shall be made in accordance with section 1.365.

²¹ Such as licensees maintaining 24-hour schedule and needing alternate operation for maintenance, or where developmental work requires alternate operation.

^{22a} By Order No. 94-A, dated and effective November 6, 1942, until further order of the Commission, section 3.71 is suspended; "and in lieu thereof, except Sundays, the minimum operating schedule for standard broadcast stations shall be one-third of the total hours it is authorized to operate between 6 a.m. and midnight, local standard time, except that in an emergency, due to causes beyond the control of the licensee, it becomes impossible to continue operating, the station may cease operation for a period of not to exceed 10 days, provided that the Commission and the Inspector in charge shall be notified in writing immediately after the emergency develops."

²² See Field Offices of the Commission.

²³ See Field Offices of the Commission.

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licensee of the dominant station of its objection or lack of objection thereto. Upon approval of such operating schedule, the Commission will affix its file mark and return one copy to the licensee authorized to operate limited time, which shall be posted with the station license and considered as a part thereof. Departure from said operating schedule will be permitted only in accordance with the procedure set forth in section 3.77.

§3.81 Secondary station; failure to reach agreement.—If the licensee of a secondary station authorized to operate limited time and a dominant station on a channel are unable to agree upon a definite time for resumption of operation by the station authorized limited time, the Commission shall be so notified by the licensee of the station authorized limited time. After receipt of such statement the Commission will designate for hearing the applications of both stations for renewal of license, and pending the hearing the schedule previously adhered to shall remain in full force and effect.

§3.82 Departure from schedule; material violation.—In all cases where a station licensee is required to prepare and file an operating schedule, any deviation or departure from such schedule, except as herein authorized, shall be considered as a violation of a material term of the license.

§3.83 Local standard time.—All references herein to standard time or local standard time refer to local standard time as determined and fixed by the Interstate Commerce Commission.

§3.84 Daylight saving time.—If local time is changed from standard time to daylight saving time at the location of all stations sharing time on the same channel, the hours of operation of all such stations on that channel shall be understood to refer to daylight saving time, and not standard time, as long as daylight saving time is observed at such locations. This provision shall govern when the time is changed by provision of law or general observance of daylight saving time by the various communities, and when the time of operation of such stations is specified in the license or is mutually agreed upon by the licensees: *Provided, however,* That when the license specifies average time of sunrise and sunset, local standard time shall be observed. In no event shall a station licensed for daytime only operate on regular schedule prior to local sunrise, or shall a station licensed for greater daytime power than nighttime power or for a different radiation pattern for daytime operation than for nighttime operation operate with the daytime power or radiation pattern prior to local sunrise.

§3.85 Changes in time; agreement between licensees.—Where the local time is not changed from standard time to daylight saving time at the location of all stations sharing time on the same channel, the hours of operation of such stations shall be understood to have reference to standard time, and not daylight saving time, unless said licensees mutually agree upon a new schedule which shall be effective only while daylight saving time is observed at the location of some of these stations.

§3.86 Local standard time; license provisions.—The time of operation of any broadcast station which does not share time with other stations on the same channel shall be understood to have reference to local standard time unless modification of such license with respect to hours of operation is authorized by the Commission.

§3.87 Program transmissions prior to local sunrise.—(a) The provisions of sections 3.6, 3.8, 3.9, 3.10, 3.23, 3.79 and 3.84 shall not prevent the transmission of programs between four o'clock a.m., local standard time, and local sunrise, of standard broadcast stations with their authorized daytime facilities, *Provided:* That the provisions of this rule shall not extend to:

(1) Stations regularly sharing time during daytime hours either under licenses pursuant to which time-sharing agreements have been entered into or licenses specifying hours of operation, unless time-sharing agreements have been reached covering such operation prior to local sunrise. Sections 3.74, 3.77, and 3.78 of these rules shall be applicable to such agreements.

(2) Any class II station causing interference^{23a} by use of its daytime facilities within the 0.5 mv/m 50% sky wave contour of any class I station either of the United States or of any country party to the North American Regional Broadcasting Agreement, except (a) where the class I station is located east of the class II station in which case operation may begin at local sunrise at the class I station; (b) where an agreement has been reached with the class I station to begin operation prior to local sunrise.

(3) Operation by use of its daytime facilities of any class II station on any class I-A channel not assigned to the United States under the North American Regional Broadcasting Agreement.

(b) Any station operating during such hours receiving notice from the Commission that undue interference is caused shall refrain from such operation during such hours pending further notice from the Commission.

(c) Nothing contained in outstanding instruments of authorization for such stations shall prohibit such operation except as herein provided.

(d) The period 4:00 a.m. to 6:00 a.m., local standard time, shall not be included in determining compliance with section 3.71 of these rules.

RULES APPLICABLE TO STATIONS ENGAGED IN CHAIN BROADCASTING

LICENSING REQUIREMENTS

§3.101 Exclusive affiliation of station.—No license shall be granted to a standard broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization²⁴ under which the station is prevented or hindered from, or penalized for, broadcasting the programs of any other network organization.²⁵

§3.102 Territorial exclusivity.—No license shall be granted to a standard broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization which prevents or hinders another station serving substantially the same area from broadcasting the network's programs not taken by the former station, or which prevents or hinders another station serving a substantially different area from broadcasting any program of the network organization. This regulation shall not be construed to prohibit any contract, arrangement, or understanding between a station and a network organization pursuant to which the station is granted the first call in its primary service area upon the programs of the network organization.²⁶

^{23a} As determined by the Standards of Good Engineering Practice Governing Standard Broadcast Stations and the North American Regional Broadcasting Agreement.

§3.103 Term of affiliation.—No license shall be granted to a standard broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization which provides, by original term, provisions for renewal, or otherwise for the affiliation of the station with the network organization for a period longer than two years: *Provided,* That a contract, arrangement, or understanding for a period up to two years, may be entered into within six months prior to the commencement of such period.²⁵

§3.104 Option time.—No license shall be granted to a standard broadcast station which options²⁶ for network programs any time subject to call on less than 56 days' notice, or more time than a total of three hours²⁷ within each of four segments of the broadcast day, as herein described. The broadcast day is divided into 4 segments, as follows: 8:00 a.m. to 1:00 p.m.; 1:00 p.m. to 6:00 p.m.; 6:00 p.m. to 11:00 p.m.; 11:00 p.m. to 8:00 a.m.²⁸ Such options may not be exclusive as against other network organizations and may not prevent or hinder the station from optioning or selling any or all of the time covered by the option, or other time, to other network organizations.²⁹

§3.105 Right to reject programs.—No license shall be granted to a standard broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization which (a), with respect to programs offered pursuant to an affiliation contract, prevents or hinders the station from rejecting or refusing network programs which the station reasonably believes to be unsatisfactory or unsuitable; or which (b), with respect to network programs so offered or already contracted for, prevents the station from rejecting or refusing any program which, in its opinion, is contrary to the public interest, or from substituting a program of outstanding local or national importance.²⁹

§3.106 Network ownership of stations.³⁰—No license shall be granted to a network organization, or to any person directly or indirectly controlled by or under common control³¹ with a network organization, for more than one standard broadcast station where one of the stations covers substantially the service area of the other station, or for any standard broadcast station in any locality where the existing standard broadcast stations are so few or of such unequal desirability (in terms of coverage, power, frequency, or other related matters) that competition would be substantially restrained by such licensing.³⁰

§3.107 Dual network operation.³²—No license shall be issued to a standard broadcast station affiliated with a network organization which maintains more than one network: *Provided,* That this regulation shall not be applicable if such networks are not operated simultaneously, or if there is no substantial overlap in the territory served by the group of stations comprising each such network.

§3.108 Control by networks of station rates.—No license shall be granted to a standard broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization under which the station is prevented or hindered from, or penalized for, fixing or altering its rates for the sale of broadcast time for other than the network's programs.³³

Subpart B—Rules Governing FM Broadcast Stations

CLASSIFICATION OF FM STATIONS AND ALLOCATION OF FREQUENCIES

§ 3.201. Numerical designation of FM channels.—For convenience, the frequencies available for FM broadcasting (including those assigned to non-commercial educational broadcasting) are given numerical designations which are shown in the table below:

[Editor's Note: FM Allocations by mc on page 206; by cities on page 442.]

§ 3.202 Areas of the United States.—For the purpose of allocation the United States is divided into two areas. The first area—Area I—includes southern New Hampshire; all of Massachusetts, Rhode Island, and Connecticut; southeastern New York as far north as Albany-Troy-Schenectady; all of New Jersey, Delaware, and the District of Columbia; Maryland as far west as Hagerstown; and eastern Pennsylvania as far west as Harrisburg.¹ The second area—Area II—comprehends the remainder of the United States not included in Area I.

¹ In some of the territory contiguous to Area I, the demand for frequencies may in the future exceed the supply and when it does this region will be added to Area I. Until then, this region will not be included in Area I but applications from this region will be given careful study and consideration to insure an equitable distribution of facilities throughout the region. This region includes the remainder of Maryland, Pennsylvania and New York (except the northeastern corner) not included in Area I; the northern half of West Virginia; all of Ohio and Indiana; southern Michigan as far north as Saginaw; eastern Illinois as far west as Rockford-Decatur; and southeastern Wisconsin as far north as Sheboygan.

²⁴ The term "network organization" as used herein includes national and regional network organizations. See Chapter VII, J. of Report on Chain Broadcasting.

²⁵ These regulations shall become effective 12:01 a.m., Eastern War Time, June 15, 1943, unless otherwise required by court order.

²⁶ As used in this section, an option is any contract, arrangement, or understanding, express or implied, between a station and a network organization which prevents or hinders the station from scheduling programs before the network agrees to utilize the time during which such programs are scheduled, or which requires the station to clear time already scheduled when the network organization seeks to utilize the time.

²⁷ All time options permitted under this section must be for specified clock hours, expressed in terms of any time system set forth in the contract agreed upon by the station and network organization. Shifts from daylight saving¹ to standard time or vice versa may or may not shift the specified hours correspondingly as agreed by the station and network organization.

²⁸ These segments are to be determined for each station in terms of local time at the location of the station but may remain constant throughout the year regardless of shifts from standard to daylight saving time or vice versa.

²⁹ These regulations shall become effective 12:01 a.m., Eastern War Time, June 15, 1943, unless otherwise required by court order.

³⁰ Effective date of this section with respect to any station may be extended from time to time in order to permit the orderly disposition of properties; and it shall be suspended indefinitely with respect to regional network organizations.

³¹ The word "control" as used herein, is not limited to full control but includes such a measure of control as would substantially affect the availability of the station to other networks.

³² This section shall become effective April 12, 1944.

³³ These regulations shall become effective 12:01 a.m., Eastern War Time, June 15, 1943, unless otherwise required by court order.

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§ 3.203 *Community Stations*.—(a) Community stations are limited to a maximum effective radiated power of 250 w and a maximum antenna height of 250 feet over the average height of the terrain 10 miles from the transmitter. Upon proper showing that an antenna height in excess of 250 feet is necessary, authorization will be issued for such higher antenna but the Commission may in such cases require a reduction in radiated power. A minimum separation of 50 miles will be provided in the case of Community stations on the same channel and a minimum of 35 miles on adjacent channels.

(b) In Area I, 20 channels beginning with 104.1 mc and ending with 107.9 mc (Channels 281 through 300) are allocated for Community stations. All of these 20 channels are available in any community which is not the principal city of a metropolitan district. Ten of these channels are also available for assignment in principal cities of metropolitan districts which have fewer than 6 Metropolitan stations.¹

(c) In Area II, 10 channels beginning with 104.1 mc and ending with 105.9 mc (Channels 281 through 290) are available for Community stations and may be used in any community which is not the principal city of a metropolitan district.²

(d) The main studio of a Community station shall be located in the city served and the transmitter shall be located as near the center of the city as practicable.

§ 3.204 *Metropolitan stations*.—(a) In Area I, Metropolitan stations are limited to a maximum of 20 kw effective radiated power with a non-directional antenna having a height of 500 feet, as determined by the methods prescribed in the Standards of Good Engineering Practice concerning FM broadcast stations. Where higher antenna heights are available, they should be used but in such cases the Commission will authorize less than 20 kw effective radiated power so that the coverage (within the 1000 uv/m contour) shall be substantially similar to that which would be provided by 20 kw effective radiated power and a 500 foot antenna. Where the only antenna height available is less than 500 feet, the Commission may authorize its use but will not permit an increase in radiated power in excess of 20 kw. In Area I, the service area of Metropolitan stations will not be protested beyond the 1000 uv/m contour and such stations will be located in such a manner as to insure, insofar as possible, a maximum of FM service to all listeners, whether urban or rural.

(b) Metropolitan stations in Area II are designed primarily to render service to a single metropolitan district or a principal city, and to rural area surrounding such metropolitan district or principal city. The Commission will designate service areas for Metropolitan stations in Area II and will authorize appropriate power and antenna height to cover the designated area in accordance with the Standards of Good Engineering Practice concerning FM broadcast stations; upon proper showing changes will be made in these service areas.³ Metropolitan stations will not be required to serve the entire service area designated by the Commission but no application will be granted for a Metropolitan station unless it is proposed to serve an area substantially greater than could be served by a Community station.

(c) Sixty frequencies are available for Metropolitan stations in Areas I and II. These frequencies begin at 92.1 mc and end at 103.9 mc (Channels 221 through 280).

(d) The main studio of a Metropolitan station shall be located within its 5000 uv/m contour. However, upon a special showing of need, the Commission may authorize the main studio to be located beyond the 5000 uv/m contour but not beyond the 1000 uv/m contour. The transmitter shall be so located as to provide maximum service both to the city where the main studio is located and to the surrounding rural area.

§ 3.205 *Rural stations*.—(a) Rural stations are designed primarily to furnish service to rural listeners. The service area of Rural stations may include the service areas designated by the Commission for Metropolitan stations upon a showing to the Commission that the additional area which the Rural station will serve is predominantly rural in character. As a guide, the Commission will consider that the additional area beyond the service area of a Metropolitan station which is proposed to be served, is predominantly rural in character if at least 50 percent of the population proposed to be added within the 50 uv/m contour live in rural areas or in communities smaller than 10,000.⁴ Exceptions to this rule will be permitted where a showing is made to the Commission that due to conditions of terrain or local factors, more extended service to unserved rural areas is possible by licensing Rural stations to serve an area which does not meet the above requirements than would otherwise be possible.

(b) Rural stations will not be licensed in Area I as presently defined. If in the future it becomes necessary to extend Area I by including part or all of the region set forth in footnote 1 of Section 3.202, consideration will be given at that time to the question whether Rural stations should be licensed in this region.

(c) The 60 channels available for Metropolitan stations are also available for Rural stations.

(d) The main studio of a Rural station shall be located within its 1000 uv/m contour. However, upon a special showing of need, the Commission may authorize the main studio to be located beyond the 1000 uv/m contour but not beyond the 50 uv/m contour.

¹ For the time being, until more FM stations are authorized, the Commission will not authorize Community stations in principal cities of metropolitan districts in Area I having 4 or more AM stations.

² The 10 frequencies from 106.1 mc to 107.9 mc which are available for Community stations in Area I but not in Area II will be assigned in Area II in the future in accordance with the needs of the area as shown by future developments. In the meantime they will be available for facsimile.

³ In determining service areas for particular communities, the Commission will give consideration to population distribution, terrain, trade areas, economics and other pertinent factors, and applicants for Metropolitan stations in Area II should include in their applications a showing as to the service area the Commission should designate for the city in question. There are several current and recognized authorities on retail trading areas or consumer trading areas from which the applicant may prepare its showing and to which the Commission will give consideration in making its determination. Among these recognized authorities are the following: J. Walter Thompson (Retail Shopping Areas), Hearst Magazines, Inc. (Consumer Trading Areas), Rand McNally Map Co. (Trading Areas), and Hagstrom Map Co.'s Four Color Retail Trading Area Map.

⁴ In making this computation, cities with populations in excess of 10,000 should be excluded if the signal in such cities is less than 500 uv/m.

RULES GOVERNING ADMINISTRATIVE PROCEDURE

§ 3.211 *Application for FM stations*.—Each applicant for a construction permit for a new FM broadcast station, change in facilities of any existing FM broadcast station, or FM station license or modification of license shall file with the Commission in Washington, D. C., three copies of applications on the appropriate form designated by the Commission and a like number of exhibits and other papers incorporated therein and made a part thereof. Only the original copy need be sworn to. If the application is for a construction permit for a new FM station, Form FCC No. 319 should be filed; (for an FM license, Form FCC No. 320 should be filed;) and for modification of an FM license or for change in facilities of an existing FM station, Form FCC No. 322 should be filed.

§ 3.212 *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.

§ 3.213 *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 60 days prior to the contemplated removal and/or installation.

§ 3.214 *Period of construction*.—Each construction permit will specify a maximum of 60 days from the date of granting thereof as the time within which construction of the station shall begin, and a maximum of six 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.

§ 3.215 *Forfeiture of construction permits: extension of time*.—(a) A construction permit shall be automatically forfeited if the station is not ready for operation within the time specified therein or within such further time as the Commission may have allowed for completion, and a notation of the forfeiture of any construction permit under this provision will be placed in the records of the Commission as of the expiration date.

(b) Any application¹ for extension of time within which to construct a station shall be filed at least thirty days prior to the expiration date of such permit if the facts supporting such application for extension are known to the applicant in time to permit such filing. In other cases such applications will be accepted upon a showing satisfactory to the Commission of sufficient reasons for filing within less than thirty days prior to the expiration date. Such applications will be granted upon a specific and detailed showing that the failure to complete was due to causes not under the control of the grantee, or upon a specific and detailed showing of other matters sufficient to justify the extension.

§ 3.216 *Equipment tests*.—(a) Upon completion of construction of an FM station in exact accordance with the terms of the construction permit, the technical provisions of the application therefor and the rules and regulations and Standards of Good Engineering Practice governing FM stations and prior to filing of application for license, the permittee is authorized to test the equipment for a period not to exceed 90 days: *Provided*, that the inspector in charge of the district in which the station is located and the Commission are notified 2 days in advance of the beginning of tests.

(b) The Commission may notify the permittee to conduct no tests or may cancel, suspend, or change the date of beginning for the period of such tests as and when such action may appear to be in the public interest, convenience, and necessity.

(c) Within the 90-day period prescribed by this section for equipment tests, field intensity measurements in accordance with the methods prescribed in the Standards of Good Engineering Practice Concerning FM Broadcasting shall be submitted to the Commission. The Commission may grant extensions of time upon showing of reasonable need therefor.² The proof of performance specified in this subsection shall be made by Metropolitan and Rural stations only and need not be made by Community stations.

§ 3.217 *Program tests*.—(a) When construction and equipment tests are completed in exact accordance with the terms of the construction permit, the technical provisions of the application therefor, and the rules and regulations and Standards of Good Engineering Practice governing FM stations, and after an application for station license has been filed with the Commission showing the transmitter to be in satisfactory operating condition, the permittee is authorized to conduct program tests in exact accordance with the terms of the construction permit for a period not to exceed 30 days: *Provided*, that the inspector in charge of the district in which the station is located and the Commission are notified 2 days in advance of the beginning of such tests.

(b) The Commission reserves the right to cancel such tests or suspend, or change the date of beginning for the period of such tests as and when such action may appear to be in the public interest, convenience, and necessity by notifying the permittee.

(c) The authorization for tests embodied in this section or Section 3.216 shall not be construed as constituting a license to operate but as a necessary part of the construction.

§ 3.218 *Normal license period*.—All FM broadcast station licenses will be issued so as to expire at the hour of 3 a.m. E.S.T. and will be issued for a normal license period of 1 year.

§ 3.219 *License, simultaneous modification and renewal*.—When an application is granted by the Commission necessitating the issuance of a modified license less than 60 days prior to the expiration date of the license sought to be modified, and an application for renewal of said license is granted subsequent or prior thereto (but within 30 days of expiration of the present license) the modified license as well as the renewal license shall be issued to conform to the combined action of the Commission.

¹ Form FCC No. 701.

² Until further notice, the Commission will grant FM licenses before proof of performance is submitted. In such cases, proof of performance shall be submitted within one year after the license has been issued or within such extension of time as the Commission may for good cause grant.

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§ 3.220 *Renewal of license.*—(a) Unless otherwise directed by the Commission, each application for renewal of an FM license shall be filed at least 60 days prior to the expiration date of the license sought to be renewed (Form FCC No. 311). No application for renewal of license of an FM broadcast station will be considered unless there is on file with the Commission, the information currently required by Sections 1.301-1.304, reference to which by date and file number shall be included in the application.

(b) Whenever the Commission regards an application for a renewal of an FM license as essential to the proper conduct of a hearing or investigation, and specifically directs that it be filed by a date certain, 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.

§ 3.221 *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 FM 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.

§ 3.222 *Repetitious applications.*—(a) Where an applicant has been afforded an opportunity to be heard with respect to a particular application for a new FM broadcast station, or for change 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 to serve in whole or in part 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 12 months from the effective date of the Commission's order.

(b) Where an appeal has been taken from the action of the Commission in denying a particular application, 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 of or for the benefit of the original parties in interest, will not be considered until the final disposition of such appeal.

§ 3.223 *Assignment or transfer of control.*—(a) *Voluntary:* Application for consent to voluntary assignment of an FM construction permit or license or for consent to voluntary transfer of control of a corporation holding an FM construction permit or license shall be filed with the Commission on Form FCC No. 314 (assignment of license) and Form FCC No. 315 (transfer of control) at least 60 days prior to the contemplated effective date of assignment or transfer of control.

(b) *Involuntary:* In the event of the death or legal disability of a permittee or licensee, or a member of a partnership, or a person directly or indirectly in control of a corporation, which is a permittee or licensee:

(1) the Commission shall be notified in writing promptly of the occurrence of such death or legal disability, and

(2) within thirty days after the occurrence of such death or legal disability, application on Form FCC No. 314 or 315 shall be filed for consent to involuntary assignment of such FM permit or license or for involuntary transfer of control of such corporation to a person or entity legally qualified to succeed to the foregoing interests under the laws of the place having jurisdiction over the estate involved.

RULES RELATING TO LICENSING POLICIES

§ 3.231 *Exclusive affiliation of station.*—No license shall be granted to an FM broadcast station having any contract, arrangement, or understanding, express or implied with a network organization¹ under which the station is prevented or hindered from, or penalized for, broadcasting the programs of any other network organization.

§ 3.232 *Territorial exclusivity.*—No license shall be granted to an FM broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization which prevents or hinders another broadcast station serving substantially the same area from broadcasting the network's programs not taken by the former station, or which prevents or hinders another broadcast station serving a substantially different area from broadcasting any program of the network organization. This regulation shall not be construed to prohibit any contract, arrangement, or understanding between a station and a network organization pursuant to which the station is granted the first call in its primary service area upon the programs of the network organization.

§ 3.233 *Term of affiliation.*—No license shall be granted to an FM broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization which provides, by original terms, provisions for renewal, or otherwise for the affiliation of the station with the network organization for a period longer than two years: *Provided,* That a contract, arrangement, or understanding for a period up to two years, may be entered into within six months prior to the commencement of such period.

§ 3.234 *Option time.*—No license shall be granted to an FM broadcast station which options² for network programs any time subject to call on less than 56 days' notice, or more time than a total of three hours³ within each of four

¹ The term "network organization" as used herein includes national and regional network organizations. See Chapter VII, J, of Report on Chain Broadcasting.

² As used in this section, an option is any contract, arrangement, or understanding, express or implied, between a station and a network organization which prevents or hinders the station from scheduling programs before the network agrees to utilize the time during which such programs are scheduled, or which requires the station to clear time already scheduled when the network organization seeks to utilize the time.

³ All time options permitted under this section must be specified clock hours, expressed in terms of any time system set forth in the contract agreed upon by the station and network organization. Shifts from daylight saving to standard time or vice versa may or may not shift the specified hours correspondingly as agreed by the station and network organization.

segments of the broadcast day, as herein described. The broadcast day is divided into 4 segments, as follows:

8:00 a.m. to 1:00 p.m.; 1:00 p.m. to 6:00 p.m.; 6:00 p.m. to 11:00 p.m.; 11:00 p.m. to 8:00 a.m.¹ Such options may not be exclusive as against other network organizations and may not prevent or hinder the station from optioning or selling any or all of the time covered by the option, or other time, to other network organizations.

§ 3.235 *Right to reject programs.*—No license shall be granted to an FM broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization which (a), with respect to programs offered pursuant to an affiliation contract, prevents or hinders the station from rejecting or refusing network programs which the station reasonably believes to be unsatisfactory or unsuitable; or which (b), with respect to network programs so offered or already contracted for, prevents the station from rejecting or refusing any program which, in its opinion, is contrary to the public interest, or from substituting a program of outstanding local or national importance.

§ 3.236 *Network ownership of stations.*—No license shall be granted to a network organization, or to any person directly or indirectly controlled by or under common control² of a network organization, for an FM broadcast station in any locality where the existing FM broadcast stations are so few or of such unequal desirability (in terms of coverage, power, frequency, or other related matters) that competition would be substantially restrained by such licensing.

§ 3.237 *Dual network operation.*—No license shall be issued to an FM broadcast station affiliated with a network organization which maintains more than one network of FM broadcast stations: *Provided,* That this regulation shall not be applicable if such networks are not operated simultaneously, or if there is no substantial overlap in the territory served by the group of stations comprising each such network.

§ 3.238 *Control by networks of station rates.*—No license shall be granted to an FM broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization under which the station is prevented or hindered from, or penalized for, fixing or altering its rates for the sale of broadcast time for other than the network's programs.

§ 3.239 *Use of Common Antenna Site.*—No FM license or renewal of an FM license will be granted to any person who owns, leases, or controls a particular site which is peculiarly suitable for FM broadcasting in a particular area and (1) which is not available for use by other FM licensees; and (2) no other comparable site is available in the area; and (3) where the exclusive use of such site by the applicant or licensee would unduly limit the number of FM stations that can be authorized in a particular area or would unduly restrict competition among FM stations.

§ 3.240 *Multiple Ownership.*—(a) No person (including all persons under common control)³ shall, directly or indirectly, own, operate, or control more than one FM broadcast station that would serve substantially the same service area as another FM broadcast station owned, operated, or controlled by such person.

(b) No person (including all persons under common control) shall, directly or indirectly, own, operate, or control more than one FM broadcast station, except upon a showing (1) that such ownership, operation, or control would foster competition among FM broadcast stations or provide an FM broadcasting service distinct and separate from existing services, and (2) that such ownership, operation, or control would not result in the concentration of control of FM broadcasting facilities in a manner inconsistent with public interest, convenience, or necessity: *Provided, however,* That the Commission will consider the ownership, operation, or control of more than six FM broadcast stations to constitute the concentration of control of FM broadcasting facilities in a manner inconsistent with public interest, convenience, or necessity.

RULES RELATING TO EQUIPMENT

§ 3.251 *Transmitter power.*—The rated power and operating power range of transmitters shall be in accordance with the Standards of Good Engineering Practice concerning FM Broadcast Stations.

§ 3.252 *Frequency monitor.*—The licensee of each FM broadcast station shall have in operation at the transmitter an approved frequency monitor independent of the frequency control of the transmitter. For detailed requirements thereof see Standards of Good Engineering Practice concerning FM Broadcast Stations.

§ 3.253 *Modulation monitor.*—The licensee of each FM broadcast station shall have in operation at the transmitter an approved modulation monitor. For detailed requirements thereof see Standards of Good Engineering Practice concerning FM Broadcast Stations.

§ 3.254 *Required transmitter performance.*—The construction, installation, operation, and performance of the FM broadcast transmitter system shall be in accordance with the Standards of Good Engineering Practice concerning FM Broadcast Stations.

§ 3.255 *Auxiliary Transmitter.*—Upon showing that a need exists for the use of an auxiliary transmitter in addition to the regular transmitter of a broadcast station, a license therefor may be issued provided that:

(a) An auxiliary transmitter may be installed either at the same location as the main transmitter or at another location.

(b) A licensed operator shall be in control whenever an auxiliary transmitter is placed in operation.

(c) The auxiliary transmitter shall be maintained so that it may be put into immediate operation at any time for the following purposes:

(1) The transmission of the regular programs upon the failure of the main transmitter.

¹ These segments are to be determined for each station in terms of local time at the location of the station but may remain constant throughout the year regardless of shifts from standard to daylight saving time or vice versa.

² The word "control" as used herein, is not limited to full control but includes such a measure of control as would substantially affect the availability of the station to other networks.

³ The word "control" as used herein is not limited to majority stock ownership, but includes actual working control in whatever manner exercised.

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(2) The transmission of regular programs during maintenance or modification¹ work on the main transmitter, necessitating discontinuance of its operation for a period not to exceed five days.

(3) Upon request by a duly authorized representative of the Commission.

(d) The auxiliary transmitter shall be tested at least once each week to determine that it is in proper operating condition and that it is adjusted to the proper frequency, except that in case of operation in accordance with paragraph (c) of this section during any week, the test in that week may be omitted provided the operation under paragraph (c) is satisfactory. A record shall be kept of the time and result of each test operating under paragraph (c). Tests shall be conducted only between midnight and 6 a.m., local standard time.

(e) The auxiliary transmitter shall be equipped with satisfactory control equipment which will enable the maintenance of the frequency emitted by the station within the limits prescribed by these regulations.

(f) The operating power of an auxiliary transmitter may be less than the authorized power of the main transmitter, but in no event shall it be greater than such power.

§ 3.256 *Alternate main transmitters.*—The licensee of a FM broadcast station may be licensed for alternate main transmitters provided that a technical need² for such alternate transmitters is shown and that the following conditions are met:

(a) Both transmitters are located at the same place.

(b) Both transmitters shall have the same power rating.

(c) Both transmitters shall meet the construction, installation, operation, and performance requirements of the Standards of Good Engineering Practice concerning FM Broadcast Stations.

§ 3.257 *Changes in equipment and antenna system.*—Licensees of FM broadcast stations shall observe the following provisions with regard to changes in equipment and antenna system:

(a) No changes in equipment shall be made:

(1) That would result in the emission of signals outside of the authorized channel.

(2) That would result in the external performance of the transmitter being in disagreement with that prescribed in the Standards of Good Engineering Practice concerning FM Broadcast Stations.

(b) Specific authority, upon filing formal application (Form FCC No. 322) therefor, is required for a change in service area or for any of the following changes:

(1) Changes involving an increase or decrease in the power rating of the transmitter.

(2) A replacement of the transmitter as a whole.

(3) Change in the location of the transmitting antenna.

(4) Change in antenna system, including transmission line.

(5) Change in location of main studio, if it is proposed to move the main studio to a different city from that specified in the license.

(6) Change in the power delivered to the antenna.

(7) Change in frequency control and/or modulation system.

(c) Specific authority, upon filing *informal* request therefor, is required for a change in the indicating instruments installed to measure transmitter power output, except by instruments of the same maximum scale reading and accuracy.

(d) Other changes, except as above provided for in this section or in Standards of Good Engineering Practice concerning FM Broadcast Stations prescribed by the Commission may be made at any time without the authority of the Commission, provided that the Commission shall be promptly notified thereof and such changes shall be shown in the next application for renewal of license.

RULES RELATING TO TECHNICAL OPERATION

§ 3.261 *Time of Operation.*—All FM broadcast stations will be licensed for unlimited time operation. Until further notice a minimum of 6 hours per day of operation will be required, which shall consist of 3 hours during the period 6 a.m. to 6 p.m., local standard time, and 3 hours during the period 6 p.m. to midnight, local standard time. In an emergency, however, when due to causes beyond the control of a licensee, it becomes impossible to continue operation, the station may cease operation for a period not to exceed 10 days, provided that the Commission and the inspector in charge of the radio district in which the station is located shall be notified in writing immediately after the emergency develops.

§ 3.262 *Experimental Operation.*—The period between 12:00 midnight, and 6 a.m., local standard time, may be used for experimental purposes in testing and maintaining apparatus by the licensee of any FM broadcast station on its assigned frequency and not in excess of its authorized power, without specific authorization from the Commission.

§ 3.263 *Station inspection.*—The licensee of any FM radio station shall make the station available for inspection by representatives of the Commission at any reasonable hour.

§ 3.264 *Station license, posting of.*—The original of each station license shall be posted in the transmitter room.

§ 3.265 *Operator requirements.*—One or more licensed radio-telephone first class operators shall be on duty at the place where the transmitting apparatus of each station is located and in actual charge thereof whenever it is being operated. The original license (Form FCC No. 759) of each station operator shall be posted at the place where he is on duty. The licensed operator on duty and in charge of an FM broadcast transmitter may, at the discretion of the licensee, be employed for other duties or for the operation of another station or stations in accordance with the class of operator's license which he holds and by the rules and regulations governing such stations. However, such duties shall in no wise interfere with the operation of the broadcast transmitter.

§ 3.266 *Facsimile broadcasting and Multiplex transmission.*—Transmission of simplex facsimile on FM channels in accordance with the Commission's Standards of Good Engineering Practice on facsimile may be permitted, upon application to the Commission, during hours not required to be devoted to FM aural broadcasting. The Commission may grant experimental authority to an

FM station for the multiplex transmission of facsimile or other signals and aural broadcast programs, provided that the transmission of facsimile or other signals is incidental to the aural broadcast, does not reduce the quality of the aural program and that a filter or other additional equipment is not required for receivers not equipped to receive facsimile or other signals.

§ 3.267 *Operating power: how determined.*—The operating power, and the requirements for maintenance thereof, of each FM broadcast station shall be determined by the methods prescribed in the Standards of Good Engineering Practice covering FM broadcast stations.

§ 3.268 *Modulation.*—The percentage of modulation of all stations shall be maintained as high as possible consistent with good quality of transmission and good broadcast practice and in no case less than 85 percent nor more than 100 percent on peaks of frequent recurrence during any selection which normally is transmitted at the highest level of the program under consideration.

§ 3.269 *Frequency tolerance.*—The center frequency of each FM broadcast station shall be maintained within 2000 cycles of the assigned center frequency.

§ 3.270 *Inspection of tower lights and associated control equipment.*—The licensee of any FM station which has an antenna or antenna supporting structure(s) required to be illuminated pursuant to the provisions of section 303 (q) of the Communications Act of 1934, as amended:

(a) Shall make a visual observation of the tower lights at least once each 24 hours to insure that all such lights are functioning properly as required.

(b) Shall report immediately by telephone or telegraph to the nearest Airways Communication Station or office of the Civil Aeronautics Administration any observed failure of the tower lights, not corrected within 30 minutes, regardless of the cause of such failure. Further notification by telephone or telegraph shall be given immediately upon resumption of the required illumination.

(c) Shall inspect at intervals of at least once each 3 months all flashing or rotating beacons and automatic lighting control devices to insure that such apparatus is functioning properly as required.

OTHER RULES RELATING TO OPERATION

§ 3.281 *Logs.*—The licensee of each FM station shall maintain program and operating logs and shall require entries to be made as follows:

(a) In the program log:

(1) An entry of the time each station identification announcement (call letters and location) is made.

(2) An entry briefly describing each program broadcast, such as "music", "drama", "speech", etc., together with the name or title thereof and the sponsor's name, with the time of the beginning and ending of the complete program. If a mechanical record is used, the entry shall show the exact nature thereof, such as "record", "transcription", etc., and the time it is announced as a mechanical reproduction. If a speech is made by a political candidate, the name and political affiliations of such speaker shall be entered.

(3) An entry showing that each sponsored program broadcast has been announced as sponsored, paid for, or furnished by the sponsor.

(4) An entry showing, for each program of network origin, the name of the network originating the program.

(b) In the operating log:

(1) An entry of the time the station begins to supply power to the antenna, and the time it stops.

(2) An entry of the time the program begins and ends.

(3) An entry of each interruption to the carrier wave, its cause, and duration.

(4) An entry of the following each 30 minutes:

(i) Operating constants of last radio stage (total plate current and plate voltage).

(ii) Transmission line current or voltage.

(iii) Frequency monitor reading.

(5) Log of experimental operation during experimental period. (If regular operation is maintained during this period, the above logs shall be kept.)

(i) A log must be kept of all operation during the experimental period. If the entries required above are not applicable thereto, then the entries shall be made so as to fully describe the operation.

(c) Where an antenna or antenna supporting structure(s) is required to be illuminated the licensee shall make entries in the radio station log appropriate to the requirements of section 3.240 as follows:

(1) The time the tower lights are turned on and off if manually controlled.

(2) The time the daily visual observation of the tower lights was made.

(3) In the event of any observed failure of a tower light.

(i) Nature of such failure.

(ii) Time the failure was observed.

(iii) Time and nature of the adjustments, repairs or replacements made.

(iv) Airways Communication Station (CAA) notified of the failure of any tower light not corrected within 30 minutes and the time such notice was given.

(v) Time notice was given to the Airways Communication Station (CAA) that the required illumination was resumed.

(4) Upon completion of the periodic inspection required at least once each three months.

(i) The date of the inspection and the condition of all tower lights and associated tower lighting control devices.

(ii) Any adjustments, replacements or repairs made to insure compliance with the lighting requirements.

§ 3.282 *Logs, retention of.*—Logs of FM stations shall be retained by the licensee for a period of 2 years. However, logs incident to or involved in any claim or complaint of which the licensee has notice shall be retained by the licensee until such claim or complaint has been fully satisfied or until the same has been barred by statute limiting the time for the filing of suits upon such claims.

§ 3.283 *Logs, by whom kept.*—Each log shall be kept by the person or persons competent to do so, having actual knowledge of the facts required, who shall sign the log when starting duty and again when going off duty. The logs shall be made available upon request by an authorized representative of the Commission.

§ 3.284 *Log form.*—The log shall be kept in an orderly manner, in suitable form, and in such detail that the data required for the particular class of station concerned are readily available. Key letters or abbreviations may be used

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¹ This includes the equipment changes which may be made without authority as set forth elsewhere in the Rules and Regulations and the Standards of Good Engineering Practice or as authorized by the Commission by letter or by construction permit. Where such operation is required for periods in excess of 5 days, request thereof shall be in accordance with section 1.365.

² Such as licensees maintaining 24-hour schedule and needing alternate operation for maintenance, or where developmental work requires alternate operation.

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if proper meaning or explanation is contained elsewhere in the log.

§ 3.285 *Correction of logs.*—No log or portion thereof shall be erased, obliterated, or willfully destroyed within the period of retention provided by the rules. Any necessary correction may be made only by the person originating the entry who shall strike out the erroneous portion, initial the correction made, and indicate the date of correction.

§ 3.286 *Rough logs.*—Rough logs may be transcribed into condensed form, but in such case the original log or memoranda and all portions thereof shall be preserved and made a part of the complete log.

§ 3.287 *Station identification.*—(a) A licensee of an FM broadcast station shall make station identification announcement (call letters and location) at the beginning and ending of each time of operation and during operation (1) on the hour and (2) either on the half hour or at the quarter hour following the hour and at the quarter hour preceding the next hour: *Provided*,

(b) Such identification announcement need not be made on the hour when to make such announcement would interrupt a single consecutive speech, play, religious service, symphony concert, or operatic production of longer duration than 30 minutes. In such cases the identification announcement shall be made at the beginning of the program, at first interruption of the entertainment continuity, and at the conclusion of the program.

(c) Such identification announcement need not be made on the half hour or quarter hours when to make such announcement would interrupt a single consecutive speech, play, religious service, symphony concert or operatic production. In such cases an identification announcement shall be made at the first interruption of the entertainment continuity and at the conclusion of the program. *Provided*, That an announcement within 5 minutes of the times specified in subdivision (2) of paragraph (a) of this section will satisfy the requirements of identification announcements.

(d) In the case of variety show programs, baseball game programs, or similar programs of longer duration than 30 minutes, the identification announcement shall be made within 5 minutes of the hour and of the times specified in subdivision (2) of paragraphs (a) of this section.

(e) In the case of all other programs the identification announcement shall be made within 2 minutes of the hour and of the times specified in subdivision (2) of paragraph (a) of this section.

(f) In making the identification announcement the call letters shall be given only on the channel of the station identified thereby.

§ 3.288 *Mechanical records.*—Each program broadcast which consists in whole or in part of one or more mechanical reproductions shall be announced in the manner and to the extent set out below.

(a) Each such program of longer duration than 30 minutes, consisting in whole or in part of one or more mechanical reproductions, shall be identified by appropriate announcement at the beginning of the program, at each 30-minute interval and at the conclusion of the program; *Provided, however*, that the identifying announcement at each 30-minute interval is not required in case of a mechanical reproduction consisting of a continuous uninterrupted speech, play, religious service, symphony concert or operatic production of longer than 30 minutes.

(b) Each such program of a longer duration than 5 minutes and not in excess of 30 minutes, consisting in whole or in part of one or more mechanical reproductions, shall be identified by an appropriate announcement at the beginning and end of the program.

(c) Each such program of five minutes or less, consisting in whole or in part of mechanical reproductions shall be identified by appropriate announcement immediately preceding the use thereof.

(d) In case a mechanical reproduction is used for background music, sound effects, station identification, program identification (theme music of short duration) or identification of the sponsorship of the program proper, no announcement of the mechanical reproduction is required.

(e) The exact form of identifying announcement is not prescribed, but the language shall be clear and in terms commonly used and understood. A licensee shall not attempt affirmatively to create the impression that any program being broadcast by mechanical reproduction consists of live talent.

§ 3.289 *Sponsored programs, announcement of.*—(a) In the case of each program for the broadcasting of which money, services, or other valuable consideration is either directly or indirectly paid or promised to, or charged or received by, any radio broadcast station, the station broadcasting such program shall make, or cause to be made, an appropriate announcement that the program is sponsored, paid for, or furnished either in whole or in part.

(b) In the case of any political program or any program involving the discussion of public controversial issues for which any records, transcriptions, talent, scripts, or other material or services of any kind are furnished, either directly or indirectly, to a station as an inducement to the broadcasting of such program, an announcement shall be made both at the beginning and conclusion of such program on which such material or services are used that such records, transcriptions, talent, scripts, or other material or services have been furnished to such station in connection with the broadcasting of such program; *Provided, however*, that only one such announcement need be made in the case of any such program of five minutes' duration or less, which announcement may be made either at the beginning or conclusion of the program.

(c) The announcement required by this section shall fully and fairly disclose the true identity of the person or persons by whom or in whose behalf such payment is made or promised, or from whom or in whose behalf such services or other valuable consideration is received, or by whom the material or services referred to in subsection (b) hereof are furnished. Where an agent or other person contracts or otherwise makes arrangements with a station on behalf of another, and such fact is known to the station, the announcement shall disclose the identity of the person or persons in whose behalf such agent is acting instead of the name of such agent.

(d) In the case of any program, other than a program advertising commercial products or services, which is sponsored, paid for or furnished, either in whole or in part, or for which material or services referred to in subsection (b) hereof are furnished, by a corporation, committee, association or other unincorporated group, the announcement required by this section, shall disclose the name of such corporation, committee, association or other unincorporated group. In each such case the station shall require that a list of the chief executive officers or members of the executive committee or of the board of directors of the corporation, committee, association or other unincorporated group shall be made available for public inspection at one of the radio stations carrying the program.

(e) In the case of programs advertising commercial products or services, an announcement stating the sponsor's corporate or trade name or the name of the sponsor's product, shall be deemed sufficient for the purposes of this section and only one such announcement need be made at any time during the course of the program.

§ 3.290 *Broadcasts by candidate for public office.*—

(a) *Definitions.*—A "legally qualified candidate" means any person who has publicly announced that he is a candidate for nomination by a convention of a political party or for nomination or election in a primary, special, or general election, municipal, county, state or national and who meets the qualifications prescribed by the applicable laws to hold the office for which he is a candidate, so that he may be voted for by the electorate directly or by means of delegates or electors, and who

(1) has qualified for a place on the ballot or

(2) is eligible under the applicable law to be voted for by sticker, by writing in his name on the ballot, or other method, and (i) has been duly nominated by a political party which is commonly known and regarded as such, or (ii) makes a substantial showing that he is a *bona fide* candidate for nomination or office, as the case may be.

(b) *General requirements.*—No station licensee is required to permit the use of its facilities by any legally qualified candidate for public office, but if any licensee shall permit any such candidate to use its facilities, it shall afford equal opportunities to all other such candidates for that office to use such facilities, *Provided*, That such licensee shall have no power of censorship over the material broadcast by any such candidate.

(c) *Rates and practices.*—The rates, if any, charged all such candidates for the same office shall be uniform and shall not be rebated by any means, directly or indirectly; no licensee shall make any discrimination in charges, practices, regulations, facilities, or services for or in connection with the service rendered pursuant to these rules, or make or give any preference to any candidate for public office or subject any such candidate to any prejudice or disadvantage; nor shall any licensee make any contract or other agreement which shall have the effect of permitting any legally qualified candidate for any public office to broadcast to the exclusion of other legally qualified candidates for the same public office.

(d) *Inspection of records.*—Every licensee shall keep and permit public inspection of a complete record of all requests for broadcast time made by or on behalf of candidates for public office, together with an appropriate notation showing the disposition made by the licensee of such requests, and the charges made, if any, if request is granted.

§ 3.291 *Rebroadcast.*—(a) The term "rebroadcast" means reception by radio of the program¹ of a radio station, and the simultaneous or subsequent retransmission of such program by a broadcast station.

(b) The licensee of an FM broadcast station may, without further authority of the Commission, rebroadcast the program of a United States standard, FM or noncommercial educational broadcast station, provided the Commission is notified of the call letters of each station rebroadcast and the licensee certifies that express authority has been received from the licensee of the station originating the program.²

(c) (1) The licensee of an FM broadcast station located within a state or the District of Columbia may, without further authority of the Commission, rebroadcast on a noncommercial basis a noncommercial program of a United States international broadcast station.

(2) The licensee of an FM broadcast station located in any territory or insular possession of the United States may, without further authority of the Commission, rebroadcast any program of a United States international broadcast station.

(3) In the case of any rebroadcast under the provisions of this paragraph (c), the Commission shall be notified of the call letters of each station whose program is rebroadcast and the licensee shall certify that express authority has been received from the licensee of the station originating the program.

(d) No licensee of an FM broadcast station shall rebroadcast the program of any United States radio station not designated in (b) or (c) above without written authority having first been obtained from the Commission upon application (informal) accompanied by written consent or certification of consent of the licensee of the station originating the program.⁴

Subpart C—General Rules Applicable to Standard Broadcast Stations

§3.401 *Station license; posting of.*—The station license and any other instrument of authorization or individual order concerning construction of the equipment or the manner of operation of the station shall be posted in a conspicuous place in the room in which the transmitter is located in such manner that all terms thereof are visible and the license of the station operator shall be posted in the same manner. (See secs. 2.51 and 2.52.)

§3.402 *Licensed operator required.*—The licensee of each station shall have a licensed operator or operators of the grade specified by the Commission on

¹ As used in this section, program includes any complete program or part thereof. transmission of such program by a broadcast station.²

² In case a program is transmitted from its point of origin to a broadcast station entirely by telephone facilities in which a section of such transmission is by radio, the broadcasting of this program is not considered a rebroadcast.

³ The notice and certification of consent shall be given within three (3) days of any single rebroadcast, but in case of the regular practice of rebroadcasting certain programs of a standard or FM broadcast station several times during a license period, notice and certification of consent shall be given for the ensuing license period with the application for renewal of license, or at the beginning of such rebroadcast practice if begun during a license period.

⁴ The broadcasting of a program relayed by a relay broadcast station or studio transmitter link is not considered a rebroadcast.

By Order No. 82, dated and effective June 24, 1941, until further order of the Commission, section 3.291(d) is suspended only insofar as it requires prior written authority of the Commission for the rebroadcasting of programs originated for that express purpose by United States Government radio stations.

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duty during all periods of actual operation of the transmitter at the place where the transmitting equipment is located. (See sec. 2.53.)

§3.403 Licensed operator; other duties.—The licensed operator on duty and in charge of a standard or high-frequency broadcast transmitter may, at the discretion of the licensee, be employed for other duties or for the operation of another radio station or stations in accordance with the class of operator's license which he holds and by the rules and regulations governing such other stations: *Provided, however,* That such duties shall in no wise interfere with the proper operation of the standard broadcast transmitter.

§3.404 Logs.—The licensee of each broadcast station shall maintain program and operating logs and shall require entries to be made as follows:

(a) In the program log:

(1) An entry of the time each station identification announcement (call letters and location) is made.

(2) An entry briefly describing each program broadcast, such as "music," "drama," "speech," etc., together with the name or title thereof, and the sponsor's name, with the time of the beginning and ending of the complete program. If a mechanical record is used, the entry shall show the exact nature thereof, such as "record," "transcription," etc., and the time it is announced as a mechanical record. If a speech is made by a political candidate, the name and political affiliations of such speaker shall be entered.

(3) An entry showing that each sponsored program broadcast has been announced as sponsored, paid for, or furnished by the sponsor.

(4) An entry showing, for each program of network origin, the name of the network originating the program.

(b) In the operating log:

(1) An entry of the time the station begins to supply power to the antenna, and the time it stops.

(2) An entry of the time the program begins and ends.

(3) An entry of each interruption to the carrier wave, its cause, and duration.

(4) An entry of the following each 30 minutes:

(i) Operating constants of last radio stage (total plate current and plate voltage.)

(ii) Antenna current.

(iii) Frequency monitor reading.

(iv) Temperature of crystal control chamber if thermometer is used.

(5) Log of experimental operation during experimental period. (If regular operation is maintained during this period, the above logs shall be kept.)

(i) A log must be kept of all operation during the experimental period. If the entries required above are not applicable thereto, then the entries shall be made so as to fully describe the operation.

(c) Where an antenna or antenna supporting structure(s) is required to be illuminated the licensee shall make entries in the radio station log appropriate to the requirements of section 2.82 (a), (b), and (c) as follows:

(1) The time the tower lights are turned on and off if manually controlled.

(2) The time the daily visual observation of the tower lights was made.

(3) In the event of any observed failure of a tower light,

(i) Nature of such failure.

(ii) Time the failure was observed.

(iii) Time and nature of the adjustments, repairs or replacements made.

(iv) Airways Communication Station (C.A.A.) notified of the failure of any tower light not corrected within thirty minutes and the time such notice was given.

(v) Time notice was given to the Airways Communication Station (C.A.A.) that the required illumination was resumed.

(4) Upon completion of the periodic inspection required at least once each three months,

(i) The date of the inspection and the condition of all tower lights and associated tower lighting control devices.

(ii) Any adjustments, replacements or repairs made to insure compliance with the lighting requirements.

§3.405 Logs, retention of.—Logs of standard or high-frequency broadcast stations shall be retained by the licensee for a period of 2 years, except when required to be retained for a longer period in accordance with the provisions of section 2.54.

§3.406 Station identification.—(a) A licensee of a standard or high-frequency broadcast station shall make station identification announcement (call letters and location) at the beginning and ending of each time of operation and during operation (1) on the hour and (2) either on the half hour or at the quarter hour following the hour and at the quarter hour preceding the next hour: *Provided,*

(b) Such identification announcement need not be made on the hour when to make such announcement would interrupt a single consecutive speech, play, religious service, symphony concert, or operatic production of longer duration than 30 minutes. In such cases the identification announcement shall be made at the beginning of the program, at the first interruption of the entertainment continuity, and at the conclusion of the program.

(c) Such identification announcement need not be made on the half hour or quarter hours when to make such announcement would interrupt a single consecutive speech, play, religious service, symphony concert, or operatic production. In such cases an identification announcement shall be made at the first interruption of the entertainment continuity and at the conclusion of the program, *Provided,* That an announcement within 5 minutes of the times specified in subdivision (2) of paragraph (a) of this section will satisfy the requirements of identification announcements.

(d) In the case of variety show programs, baseball game broadcasts, or similar programs of longer duration than 30 minutes, the identification announcement shall be made within 5 minutes of the hour and of the times specified in subdivision (2) of paragraph (a) of this section.

(e) In the case of all other programs the identification announcement shall be made within 2 minutes of the hour and of the times specified in subdivision (2) of paragraph (a) of this section.

(f) In making the identification announcement the call letters shall be given only on the channel of the station identified thereby.

§3.407 Mechanical records. Each program broadcast which consists in whole or in part of one or more mechanical reproductions shall be announced in the manner and to the extent set out below.

(a) Each such program of longer duration than 30 minutes, consisting in whole or in part of one or more mechanical reproductions, shall be identified by appropriate announcement at the beginning of the program, at each 30-minute interval and at the conclusion of the program: *Provided, however,* That the identifying announcement at each 30-minute interval is not required in case of a mechanical record consisting of a continuous uninterrupted speech, play, religious service, symphony concert or operatic production of longer than 30 minutes.

(b) Each such program of a longer duration than 5 minutes and not in excess of 30 minutes, consisting in whole or in part of one or more mechanical reproductions, shall be identified by an appropriate announcement at the beginning and end of the program.

(c) Each such program of five minutes or less, consisting in whole or in part of mechanical reproductions, shall be identified by appropriate announcement immediately preceding the use thereof.

(d) In case a mechanical record is used for background music, sound effects, station identification, program identification (theme music of short duration) or identification of the sponsorship of the program proper, no announcement of the mechanical record is required.

(e) The exact form of identifying announcement is not prescribed, but the language shall be clear and in terms commonly used and understood. A licensee shall not attempt affirmatively to create the impression that any program being broadcast by mechanical reproduction consists of live talent.

§3.408 Rebroadcast.—(a) The term "rebroadcast" means reception by radio of the program¹ of a radio station, and the simultaneous or subsequent retransmission of such program by a broadcast station.²

(b) The licensee of a standard or high frequency broadcast station may, without further authority of the Commission, rebroadcast the program of a United States standard or high frequency broadcast station, provided the Commission is notified of the call letters of each station rebroadcast and the licensee certifies that express authority has been received from the licensee of the station originating the program.³

(c) (1) The licensee of a standard or high frequency broadcast station located within a state or the District of Columbia may, without further authority of the Commission, rebroadcast on a noncommercial basis a noncommercial program of a United States international broadcast station.

(2) The licensee of a standard or high frequency broadcast station located in any territory or insular possession of the United States may, without further authority of the Commission, rebroadcast any program of a United States international broadcast station.

(3) In the case of any rebroadcast under the provisions of this paragraph (c), the Commission shall be notified of the call letters of each station whose programs are rebroadcast and the licensee shall certify that express authority has been received from the licensee of the station originating the program.

(d) No licensee of a standard or high frequency broadcast station shall rebroadcast the program of any other class of United States radio station without written authority having first been obtained from the Commission upon application accompanied by written consent or certification of consent of the licensee of the station originating the program.^{4 5 6 a}

(e) In case of a program rebroadcast by several standard broadcast stations, such as a chain rebroadcast, the person legally responsible for distributing the program or the network facilities may obtain the necessary authorization for the entire rebroadcast both from the Commission and from the person or licensee of the station originating the program.

Attention is directed to section 325(b) of the Communications Act of 1934, which reads as follows:

No person shall be permitted to locate, use, or maintain a radio broadcast studio or other place or apparatus from which or whereby sound waves are converted into electrical energy, or mechanical or physical reproduction of sound waves produced, and caused to be transmitted or delivered to a radio station in a foreign country for the purpose of being broadcast from any radio station there, having a power output of sufficient intensity, and/or being so located geographically that its emissions may be received consistently in the United States, without first obtaining a permit from the Commission upon proper application therefor.⁶

§3.409 Sponsored programs, announcement of.—(a) In the case of each program for the broadcasting of which money, services, or other valuable consideration is either directly or indirectly paid or promised to, or charged or received by, any radio broadcast station, the station broadcasting such program shall make, or cause to be made, an appropriate announcement that the program is sponsored, paid for, or furnished, either in whole or in part.

(b) In the case of any political program or any program involving the discussion of public controversial issues for which any records, transcriptions, talent, scripts, or other material or services of any kind are furnished, either directly or indirectly, to a station as an inducement to the broadcasting of such program, an announcement shall be made both at the beginning and conclusion of such program on which such material or services are used that such records, transcriptions, talent, scripts, or other material or services have been furnished to such station in connection with the broadcasting of such program: *Provided, how-*

¹ As used in sec. 3.408, program includes any complete program or part thereof, or any signals if other than A-3 emission.

² In case a program is transmitted from its point of origin to a broadcast station entirely by telephone facilities in which a section of such transmission is by radio, the broadcasting of this program is not considered a rebroadcast.

³ The notice and certification of consent shall be given within three (3) days of any single rebroadcast, but in case of the regular practice of rebroadcasting certain programs of a standard or high frequency broadcast station several times during a license period, notice and certification of consent shall be given for the ensuing license period with the application for renewal of license, or at the beginning of such rebroadcast practice if begun during a license period.

⁴ The broadcasting of a program relayed by a relay broadcast station (sec. 4.21) is not considered a rebroadcast.

⁵ Informal application may be employed.

^{6 a} By Order No. 82, dated and effective June 24, 1941, until further order of the Commission, section 3.408(d) is suspended only insofar as it requires prior written authority of the Commission for the rebroadcasting of programs originated for that express purpose by United States Government radio stations.

^{6 b} Formal application required. See Standards of Good Engineering Practice for form number.

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ever. That only one such announcement need be made in the case of any such program of five minutes' duration or less, which announcement may be made either at the beginning or the conclusion of the program.

(c) The announcement required by this section shall fully and fairly disclose the true identity of the person or persons by whom or in whose behalf such payment is made or promised, or from whom or in whose behalf such services or other valuable consideration is received, or by whom the material or services referred to in subsection (b) hereof are furnished. Where an agent or other person contracts or otherwise makes arrangements with a station on behalf of another, and such fact is known to the station, the announcement shall disclose the identity of the person or persons in whose behalf such agent is acting instead of the name of such agent.

(d) In the case of any program, other than a program advertising commercial products or services, which is sponsored, paid for or furnished, either in whole or in part, or for which material or services referred to in subsection (b) hereof are furnished, by a corporation, committee, association or other unincorporated group, the announcement required by this section shall disclose the name of such corporation, committee, association or other unincorporated group. In each such case the station shall require that a list of the chief executive officers or members of the executive committee or of the board of directors of the corporation committee, association or other unincorporated group shall be made available for public inspection at one of the radio stations carrying the program.

(e) In the case of programs advertising commercial products or services, an announcement stating the sponsor's corporate or trade name or the name of the sponsor's product, shall be deemed sufficient for the purposes of this section and only one such announcement need be made at any time during the course of the program.

BROADCASTS BY CANDIDATES FOR PUBLIC OFFICE

§3.421 General requirements.—No station licensee is required to permit the use of its facilities by any legally qualified candidate for public office, but if any licensee shall permit any such candidate to use its facilities, it shall afford equal opportunities to all other such candidates for that office to use such facilities, *Provided*, That such licensee shall have no power of censorship over the material broadcast by any such candidate.

§3.422 Definitions.—A "legally qualified candidate" means any person who has publicly announced that he is a candidate for nomination by a convention of a political party or for nomination or election in a primary, special, or general election, municipal, county, state or national, and who meets the qualifications prescribed by the applicable laws to hold the office for which he is a candidate, so that he may be voted for by the electorate directly or by means of delegates or electors, and who

(a) has qualified for a place on the ballot or

(b) is eligible under the applicable law to be voted for by sticker, by writing in his name on the ballot, or other method, and (1) has been duly nominated by a political party which is commonly known and regarded as such, or (2) makes a substantial showing that he is a *bona fide* candidate for nomination or office, as the case may be.

§3.423 Rates and practices.—The rates, if any, charged all such candidates for the same office shall be uniform and shall not be rebated by any means, directly or indirectly; no licensee shall make any discrimination in charges, practices, regulations, facilities, or services for or in connection with the service rendered pursuant to these rules, or make or give any preference to any candidate for public office or subject any such candidate to any prejudice or disadvantage; nor shall any licensee make any contract or other agreement which shall have the effect of permitting any legally qualified candidate for any public office to broadcast to the exclusion of other legally qualified candidates for the same public office.

§3.424 Records; inspection.—Every licensee shall keep and permit public inspection of a complete record of all requests for broadcast time made by or on behalf of candidates for public office, together with an appropriate notation showing the disposition made by the licensee of such requests, and the charges made, if any, if request is granted.

Subpart D—Rules Governing Television Broadcast Station

§3.601 Numerical designation of television channels.—The channels or frequency bands set forth below are available for television broadcast stations.

Channel No.	Megacycles	Channel No.	Megacycles
1.....	44-50	8.....	180-186
2.....	54-60	9.....	186-192
3.....	60-66	10.....	192-198
4.....	66-72	11.....	198-204
5.....	76-82	12.....	204-210
6.....	82-88	13.....	210-216
7.....	174-180		

§3.602 Sharing of Television Channels.—Channels 1 through 5 and 7 through 13 are available for assignment to radio services other than television upon a showing that no mutual interference will result.

§3.603 Community stations.—(a) A Community station is designed primarily for rendering service to the smaller metropolitan districts or principal cities. Television channel No. 1 is assigned exclusively for Community stations. Channels 2 to 13, inclusive, can also be used for Community stations provided such use complies with Section 3.606.

(b) The power of a Community station may not exceed an effective radiated peak power of 1 kilowatt. The maximum antenna height for such stations shall be 500 feet above the average terrain as determined by methods prescribed in the Standards of Good Engineering Practice concerning Television Broadcast Stations.

(c) The main studio of a Community station shall be located in the city or town served and the transmitter shall be located as near the center of the city as practicable.

§3.604 Metropolitan stations.—(a) Metropolitan stations may be assigned to television channels 2 through 13, both inclusive. They are designed primarily to render service to a single metropolitan district or a principal city and to the rural area surrounding such metropolitan district or principal city.

(b) Metropolitan stations are limited to a maximum of 50 kilowatts effective radiated peak power with antenna having a height of 500 feet above the average

terrain, as determined by the methods prescribed in Standards of Good Engineering Practice concerning television broadcast stations. Where higher antenna heights are available, they should be used but in such cases the Commission may authorize less than 50 kilowatts effective radiated peak power so that the coverage (within the 5000 uv/m contour) shall be substantially similar to that which would be provided by 50 kilowatts effective radiated peak power and a 500 foot antenna. Where it is shown that an antenna height of 500 feet is not available, the Commission may authorize the use of a lower height antenna but will not permit an increase in radiated power in excess of 50 kilowatts. The service area of Metropolitan stations will not be protected beyond the 5000 uv/m contour and such stations will be located in such a manner as to insure, insofar as possible, a maximum of television service to all listeners, whether urban or rural.

(c) The main studio for Metropolitan stations shall be located in the city or metropolitan district with which the station is associated and the transmitter should be located so as to provide the maximum service to the city or metropolitan district served.

§3.605 Rural stations.—(a) Licensees of Metropolitan stations or applicants who desire to qualify as licensees of Rural stations must make a special showing to the Commission that they propose to serve an area more extensive than that served by a Metropolitan station and that the additional area proposed to be served is predominantly rural in character. In addition, a showing must be made that such use of the channel will not cause objectionable interference to other television stations or prevent the assignment of other television stations where there is reasonable evidence of the probability of such station being located in the future.

(b) Channels 2 through 13 are available for assignment to Rural stations. The service area of Rural stations will be determined by the Commission.

(c) The main studio of Rural stations shall be located within the 500 uv/m contour.

§3.606 Table Showing Allocation of Television Channels to Metropolitan Districts in the United States.—(a) The table below sets forth the channels which are available for the areas indicated. The table below will be revised from time to time depending upon the demand for television stations which may exist in the various cities. Where it is desired to use a different channel in any such area, or to use one of the channels in another area conflicting therewith, it must be shown that public interest, convenience, or necessity will be better served thereby than by the allocation set forth in the table.

(b) Only the first 140 metropolitan districts are listed in the table below. Stations in other metropolitan or city areas not listed in the table will not be assigned closer than 150 miles on the same channel or 75 miles on adjacent channels, except upon an adequate showing that public interest, convenience, or necessity would be better served thereby or that by using lower power or by other means equivalent protection is provided.

(c) Persons desiring to enter into a voluntary sharing arrangement of a television channel may file application therefor with the Commission pursuant to the provisions of Section 3.661(c).

[Editor's Note: Complete log of television allocations to districts on page 441.]

§3.611 Application for television stations.—Each applicant for a construction permit for a new television broadcast station, change in facilities of any existing television broadcast station, or television station license or modification of license shall file with the Commission in Washington, D. C., three copies of applications on the appropriate form designated by the Commission and a like number of exhibits and other papers incorporated therein and made a part thereof. Only the original copy need be sworn to. If the application is for a construction permit for a new television station, Form FCC No. 330 should be filed; for a television station license, Form FCC No. 331 should be filed; and for modification of a television station license or for change in facilities of an existing television station, Form FCC No. 333 should be filed.

§3.612 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.

§3.613 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 60 days prior to the contemplated removal and/or installation.

§3.614 Period of construction.—Each construction permit will specify a maximum of 60 days from the date of granting thereof as the time within which construction of the station shall begin, and a maximum of six 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.

§3.615 Forfeiture of construction permits: extension of time.—(a) A construction permit shall be automatically forfeited if the station is not ready for operation within the time specified therein or within such further time as the Commission may have allowed for completion, and a notation of the forfeiture of any construction permit under this provision will be placed in the records of the Commission as of the expiration date.

(b) An application (Form FCC No. 701) for extension of time within which to construct a station shall be filed at least thirty days prior to the expiration date of such permit if the facts supporting such application for extension are known to the applicant in time to permit such filing. In other cases such applications will be accepted upon a showing satisfactory to the Commission of sufficient reasons for filing within less than thirty days prior to the expiration date. Such applications will be granted upon a specific and detailed showing that the failure to complete was due to causes not under the control of the grantee, or upon a specific and detailed showing of other matters sufficient to justify the extension.

§3.616 Equipment tests and proof of performance.—(a) Upon completion of construction of a television station in exact accordance with the terms of the construction permit, the technical provisions of the application therefor and the rules and regulations and standards of good engineering practice governing television stations and prior to filing of application for license, the permittee is authorized to test the equipment for a period not to exceed 90 days: *Provided*, that the inspector in charge of the district in which the station is located and the Commission are notified 2 days in advance of the beginning of tests.

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(b) The Commission may notify the permittee to conduct no tests or may cancel, suspend, or change the date of beginning for the period of such tests as and when such action may appear to be in the public interest, convenience, and necessity.

(c) Within the 90-day period prescribed by this section for equipment tests, field intensity measurements in accordance with the methods prescribed in the Standards of Good Engineering Practice Concerning Television Broadcast Stations shall be submitted to the Commission. The Commission may grant extensions of time upon showing of reasonable need therefor.

§3.617 Program tests.—(a) When construction and equipment tests are completed in exact accordance with the terms of the construction permit, the technical provisions of the application therefor, and the rules and regulations and standards of good engineering practice governing television stations, and after an application for station license has been filed with the Commission showing the equipment to be in satisfactory operating condition, the permittee is authorized to conduct program tests in exact accordance with the terms of the construction permit for a period not to exceed 30 days: *Provided*, That the inspector in charge of the district in which the station is located and the Commission are notified 2 days in advance of the beginning of such tests.

(b) The Commission reserves the right to cancel such tests or suspend, or change the date of beginning for the period of such tests as and when such action may appear to be in the public interest, convenience, and necessity by notifying the permittee.

(c) The authorization for tests embodied in this section or Section 3.616 shall not be construed as constituting a license to operate but as a necessary part of the construction.

§3.618 Normal license period.—All television broadcast station licenses will be issued so as to expire at the hour of 3 a.m. E.S.T. and will be issued for a normal license period of 1 year.

§3.619 License, simultaneous modification and renewal.—When an application is granted by the Commission necessitating the issuance of a modified license less than 60 days prior to the expiration date of the license sought to be modified, and an application for renewal of said license is granted subsequent or prior thereto (but within 30 days of expiration of the present license) the modified license as well as the renewal license shall be issued to conform to the combined action of the Commission.

§3.620 Renewal of license.—(a) Unless otherwise directed by the Commission, each application for renewal of a television station license shall be filed at least 60 days prior to the expiration date of the license sought to be renewed (Form FCC No. 311). No application for renewal of license of a television broadcast station will be considered unless there is on file with the Commission, the information currently required by Section 1.301-1.304 reference to which by date and file number shall be included in the application.

(b) Whenever the Commission regards an application for a renewal of a television station license as essential to the proper conduct of a hearing or investigation, and specifically directs that it be filed by a date certain, 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.

§3.621 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 television 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.

§3.622 Repetitious applications.—(a) Where an applicant has been afforded an opportunity to be heard with respect to a particular application for a new television broadcast station, or for change 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 to serve in whole or in part 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 12 months from the effective date of the Commission's order.

(b) Where an appeal has been taken from the action of the Commission in denying a particular application, 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 of or for the benefit of the original parties in interest, will not be considered until the final disposition of such appeal.

§3.623 Assignment or transfer of control.—(a) *Voluntary*: Application for consent to voluntary assignment of a television station construction permit or license or for consent to voluntary transfer of control of a corporation holding a television station construction permit or license shall be filed with the Commission on Form FCC No. 314 (assignment of license) or Form FCC No. 315 (transfer of control) at least 60 days prior to the contemplated effective date of assignment or transfer of control.

(b) *Involuntary*: In the event of the death or legal disability of a permittee or licensee, or a member of a partnership, or a person directly or indirectly in control of a corporation, which is a permittee or licensee:

(1) the Commission shall be notified in writing promptly of the occurrence of such death or legal disability, and

(2) within thirty days after the occurrence of such death or legal disability, application on Form FCC No. 314 or 315 shall be filed for consent to involuntary assignment of such television station permit or license or for involuntary transfer of control of such corporation to a person or entity legally qualified to succeed to the foregoing interests under the laws of the place having jurisdiction over the estate involved.

RULES RELATING TO LICENSING POLICIES

§3.631 Exclusive affiliation of station.—No license shall be granted to a television broadcast station having any contract, arrangement, or understand-

ing, express or implied with a network organization¹ under which the station is prevented or hindered from, or penalized for, broadcasting the programs of any other network organization.

§3.632 Territorial exclusivity.—No license shall be granted to a television broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization which prevents or hinders another broadcast station serving substantially the same area from broadcasting the network's programs not taken by the former station, or which prevents or hinders another broadcast station serving a substantially different area from broadcasting any program of the network organization. This regulation shall not be construed to prohibit any contract, arrangement, or understanding between a station and a network organization pursuant to which the station is granted the first call in its primary service area upon the programs of the network organization.

§3.633 Term of affiliation.—No license shall be granted to a television broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization which provides, by original terms, provisions for renewal, or otherwise for the affiliation of the station with the network organization for a period longer than two years: *Provided*, that a contract, arrangement, or understanding for a period up to two years, may be entered into within six months prior to the commencement of such period.

§3.634 Option time.—No license shall be granted to a television broadcast station which options² for network programs any time subject to call on less than 56 days' notice, or more time than a total of three hours³ within each of four segments of the broadcast day, as herein described. The broadcast day is divided into 4 segments, as follows: 8:00 a.m. to 1:00 p.m.; 1:00 p.m. to 6:00 p.m.; 6:00 p.m. to 11:00 p.m.; 11:00 p.m. to 8:00 a.m.⁴ Such options may not be exclusive as against other network organizations and may not prevent or hinder the station from optioning or selling any or all of the time covered by the option, or other time, to other network organizations.

§3.635 Right to reject programs.—No license shall be granted to a television broadcast station having any contract, arrangement, or understanding, express or implied, with a network organization which (a), with respect to programs offered pursuant to an affiliation contract, prevents or hinders the station from rejecting or refusing network programs which the station reasonably believes to be unsatisfactory or unsuitable; or which (b), with respect to network programs so offered or already contracted for, prevents the station from rejecting or refusing any program which, in its opinion, is contrary to the public interest, or from substituting a program of outstanding local or national importance.

§3.636 Network ownership of stations.—No license shall be granted to a network organization, or to any person directly or indirectly controlled by or under common control⁵ of a network organization, for a television broadcast station in any locality where the existing television broadcast stations are so few or of such unequal desirability (in terms of coverage, power, frequency, or other related matters) that competition would be substantially restrained by such licensing.

§3.637 Dual network operation.—No license shall be issued to a television broadcast station affiliated with a network organization which maintains more than one network of television broadcast stations: *Provided*, that this regulation shall not be applicable if such networks are not operated simultaneously, or if there is no substantial overlap in the territory served by the group of stations comprising each such network.

§3.638 Control by networks of station rates.—No license shall be granted to a television broadcast station having any contract, arrangement, or understanding, express or implied with a network organization under which the station is prevented or hindered from, or penalized for, fixing or altering its rates for the sale of broadcast time for other than the network's programs.

§3.639 Use of common antenna site.—No television license or renewal of a television license will be granted to any person who owns, leases, or controls a particular site which is peculiarly suitable for television broadcasting in a particular area and (1) which is not available for use by other television licensees; and (2) no other comparable site is available in the area; and (3) where the exclusive use of such site by the applicant or licensee would unduly limit the number of television stations that can be authorized in a particular area or would unduly restrict competition among television stations.

§3.640 Multiple ownership.—(a) No person (including all persons under common control)⁶ shall, directly or indirectly, own, operate, or control more than one television broadcast station that would serve substantially the same service area as another television broadcast station owned, operated, or controlled by such person.

(b) No person (including all persons under common control) shall, directly or indirectly, own, operate, or control more than one television broadcast station, except upon a showing (1) that such ownership, operation, or control would foster competition among television broadcast stations or provide a television

¹ The term "network organization" as used herein includes national and regional network organizations. See Chapter VII, J, of Report on Chain Broadcasting.

² As used in this section, an option is any contract, arrangement, or understanding, express or implied, between a station and a network organization which prevents or hinders the station from scheduling programs before the network agrees to utilize the time during which such programs are scheduled, or which requires the station to clear time already scheduled when the network organization seeks to utilize the time.

³ All time options permitted under this section must be specified clock hours, expressed in terms of any time system set forth in the contract agreed upon by the station and network organization. Shifts from daylight saving to standard time or vice versa may or may not shift the specified hours correspondingly as agreed by the station and network organization.

⁴ These segments are to be determined for each station in terms of local time at the location of the station but may remain constant throughout the year regardless of shifts from standard to daylight saving time or vice versa.

⁵ The word "control" as used herein, is not limited to full control, but includes such a measure of control as would substantially affect the availability of the station to other networks.

⁶ The word "control" as used herein is not limited to majority stock ownership, but includes actual working control in whatever manner exercised.

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broadcasting service distinct and separate from existing services, and (2) that such ownership, operation, or control would not result in the concentration of control of television broadcasting facilities in a manner inconsistent with public interest, convenience, or necessity; provided, however, that the Commission will consider the ownership, operation, or control of more than five television broadcast stations to constitute the concentration of control of television broadcasting facilities in a manner inconsistent with public interest, convenience, or necessity.

RULES RELATING TO EQUIPMENT

§3.651 Transmitter power.—The rated power and operating power range of transmitters shall be in accordance with the Standards of Good Engineering Practice concerning Television Broadcast Stations.

§3.652 Frequency monitors.—The licensee of each television broadcast station shall have in operation at the transmitters frequency monitors independent of the frequency control of the transmitters.

§3.653—Modulation monitors.—The licensee of each television broadcast station shall have in operation at the transmitter a modulation monitor for the aural transmitter. There shall also be sufficient monitoring equipment for the visual signal to determine that the signal complies with the Standards of Good Engineering Practice concerning Television Broadcast Stations.

§3.654 Required transmitter performance.—The construction, installation, operation, and performance of the television broadcast transmitter system shall be in accordance with the Standards of Good Engineering Practice concerning Television Broadcast Stations.

§3.655 Auxiliary transmitter.—Upon showing that a need exists for the use of auxiliary transmitters in addition to the regular transmitters of a television station, a license therefor may be issued provided that:

(a) Auxiliary transmitters may be installed either at the same location as the main transmitter or at another location.

(b) A licensed operator shall be in control whenever auxiliary transmitters are placed in operation.

(c) The auxiliary transmitters shall be maintained so that they may be put into immediate operation at any time for the following purposes:

(1) The transmission of the regular programs upon the failure of the main transmitters.

(2) The transmission of regular programs during maintenance or modification work on the main transmitters necessitating discontinuance of its operation for a period not to exceed five days.

(3) Upon request by a duly authorized representative of the Commission.

(d) The auxiliary transmitters shall be tested at least once each week to determine that it is in proper operating condition and that it is adjusted to the proper frequency, except that in case of operation in accordance with paragraph (c) of this section during any week, the test in that week may be omitted provided the operation under paragraph (c) is satisfactory. A record shall be kept of the time and result of each test operating under paragraph (c).

(e) The auxiliary transmitters shall be equipped with satisfactory control equipment which will enable the maintenance of the frequency emitted by the station within the limits prescribed by these regulations.

(f) The operating power of an auxiliary transmitter may be less than the authorized power of the main transmitters, but in no event shall it be greater than such power.

§3.656 Alternate main transmitters.—The licensee of a television broadcast station may be licensed for alternate main transmitters provided that a technical need for such alternate transmitters is shown and that the following conditions are met:

(a) Both transmitters are located at the same place.

(b) Both transmitters shall have the same power rating.

(c) Both transmitters shall meet the construction, installation, operation, and performance requirements of the Standards of Good Engineering Practice concerning Television Broadcast Stations.

§3.657 Changes in equipment and antenna system.—Licensees of television broadcast stations shall observe the following provisions with regard to changes in equipment and antenna system:

(a) No changes in equipment shall be made:

(1) That would result in the emission of signals outside of the authorized channel.

(2) That would result in the external performance of the transmitter being in disagreement with that prescribed in the Standards of Good Engineering Practice concerning Television Broadcast Stations.

(b) Specific authority, upon filing formal application (Form FCC No. 333) therefor, is required for a change in service area or for any of the following changes:

(1) Changes involving an increase or decrease in the power rating of the transmitters.

(2) A replacement of the transmitters as a whole.

(3) Change in the location of the transmitting antenna.

(4) Change in antenna system, including transmission line.

(5) Change in location of main studio, if it is proposed to move the main studio to a different city from that specified in the license.

(6) Change in the power delivered to the antenna.

(7) Change in frequency control and/or modulation system.

(c) Specific authority, upon filing informal request therefor, is required for a change in the indicating instruments installed to measure transmitter power output, except by instruments of the same maximum scale reading and accuracy.

(d) Other changes, except as above provided for in this section or in Standards of Good Engineering Practice concerning Television Broadcast Stations prescribed by the Commission may be made at any time without the authority of the Commission, provided that the Commission shall be promptly notified thereof and such changes shall be shown in the next application for renewal of license.

RULES RELATING TO TECHNICAL OPERATION

§3.661 Time of operation.—(a) All television broadcast stations will be licensed for unlimited time operation. Each licensed television station shall

¹ This includes the equipment changes which may be made without authority as set forth elsewhere in the Rules and Regulations and the Standards of Good Engineering Practice or as authorized by the Commission by letter or by construction permit. Where such operation is required for periods in excess of 5 days, request therefor shall be in accordance with section 1.365.

maintain a regular program operating schedule of not less than 2 hours in any given broadcast day, and it shall render not less than 28 hours program service per week. In an emergency, however, when due to causes beyond the control of a licensee, it becomes impossible to continue operation, the station may cease operation for a period not to exceed 10 days, provided that the Commission and the Inspector in Charge of the radio district in which the station is located shall be notified in writing immediately after the emergency develops.

(b) The aural transmitter of a television broadcast station shall not be operated separately from the visual transmitter except for experimental or test purposes, and for purposes incidental to or connected with the operation of the visual transmitter.

(c) Persons desiring to enter into a voluntary sharing arrangement of a television channel may file application therefor with the Commission. Copies of the time-sharing agreement should be filed with the application.

§3.662 Experimental operation.—Television broadcast stations may conduct technical experimentation directed to the improvement of technical phases of operation and for such purposes may utilize a signal other than the standard television signal subject to the following conditions:

(a) That the licensee complies with the provisions of section 3.661 with regard to the minimum number of hours of transmission with a standard television signal.

(b) That no transmissions are radiated outside of the authorized channel and subject to the condition that no interference is caused to the transmissions of a standard television signal by other television broadcast stations.

(c) No charges either direct or indirect shall be made by the licensee of a television broadcast station for the production or transmission of programs when conducting technical experimentation.

§3.663 Station inspection.—The licensee of any television broadcast station shall make the station available for inspection by representatives of the Commission at any reasonable hour.

§3.664 Station license, posting of.—The original of each station license shall be posted in the transmitter room.

§3.665 Operator requirements.—One or more licensed radio-telephone first class operations shall be on duty at the place where the transmitting apparatus of each station is located and in actual charge thereof whenever it is being operated. The original license (Form FCC No. 759) of each station operator shall be posted at the place where he is on duty. The licensed operator on duty and in charge of a television broadcast transmitter may, at the discretion of the licensee, be employed for other duties or for the operation of another station or stations in accordance with the class of operator's license which he holds and by the rules and regulations governing such stations. However, such duties shall in no wise interfere with the operation of the broadcast transmitter.

§3.666 Operating power: how determined.—The operating power, and the requirements for maintenance thereof, of each television broadcast station shall be determined by the methods prescribed in the Standards of Good Engineering Practice concerning Television Broadcast Stations.

§3.667 Modulation.—The percentage of modulation of the aural transmissions shall be maintained as high as possible consistent with good quality of transmission and good broadcast practice and in no case less than 85 per cent nor more than 100 per cent on peaks of frequent recurrence during any selection which normally is transmitted at the highest level of the program under consideration.

§3.668 Frequency Tolerance.—The operating frequencies of the aural and visual transmitters of a television broadcast station shall be maintained within .002% of the assigned frequencies.

§3.669 Inspection of tower lights and associated control equipment.—The licensee of any television station which has an antenna or antenna supporting structure(s) required to be illuminated pursuant to the provisions of section 303(q) of the Communications Act of 1934, as amended:

(a) Shall make a visual observation of the tower lights at least once each 24 hours to insure that all such lights are functioning properly as required.

(b) Shall report immediately by telephone or telegraph to the nearest Airways Communication Station or office of the Civil Aeronautics Administration any observed failure of the tower lights, not corrected within 30 minutes, regardless of the cause of such failure. Further notification by telephone or telegraph shall be given immediately upon resumption of the required illumination.

(c) Shall inspect at intervals of at least once each 3 months all flashing or rotating beacons and automatic lighting control devices to insure that such apparatus is functioning properly as required.

OTHER RULES RELATING TO OPERATION

§3.681 Logs.—The licensee of each television station shall maintain program and operating logs and shall require entries to be made as follows:

(a) In the program log:

(1) An entry of the time each station identification announcement (call letters and location) is made.

(2) An entry briefly describing each program broadcast, such as "music," "drama," "speech," etc., together with the name or title thereof and the sponsor's name, with the time of the beginning and ending of the complete program. If a mechanical reproduction, either visual or aural, is used, the entry shall show the exact nature thereof, and the time it is announced as a mechanical reproduction. If a speech is made by a political candidate, the name and political affiliations of such speaker shall be entered.

(3) An entry showing that each sponsored program broadcast has been announced as sponsored, paid for, or furnished by the sponsor.

(4) An entry showing, for each program of network origin, the name of the network originating the program.

(b) In the operating log:

(1) An entry of the time the station begins to supply power to the antenna, and the time it stops.

(2) An entry of the time the program begins and ends.

(3) An entry of each interruption to the carrier wave, its cause, and duration.

(4) An entry of the following each 30 minutes:

(i) Operating constants of last radio stage of the aural transmitter (total plate current and plate voltage).

(ii) Transmission line current or voltage of both transmitters.

(iii) Frequency monitor reading.

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(5) Log of experimental operation during experimental period (if regular operation is maintained during this period, the above logs shall be kept).

(1) A log must be kept of all operation during the experimental period. If the entries required above are not applicable thereto, then the entries shall be made so as to fully describe the operation.

(c) Where an antenna or antenna supporting structure(s) is required to be illuminated, the licensee shall make entries in the radio station log appropriate to the requirements of section 3.669 as follows:

(1) The time the tower lights are turned on and off if manually controlled.

(2) The time the daily visual observation of the tower lights was made.

(3) In the event of any observed failure of a tower light.

(i) Nature of such failure.

(ii) Time the failure was observed.

(iii) Time and nature of the adjustments, repairs or replacements made.

(iv) Airways Communication Station (C.A.A.) notified of the failure of any tower light not corrected within thirty minutes and the time such notice was given.

(v) Time notice was given to the Airways Communication Station (C.A.A.) that the required illumination was resumed.

(4) Upon completion of the periodic inspection required at least once each three months.

(i) The date of the inspection and the condition of all tower lights and associated tower lighting control devices.

(ii) Any adjustments, replacements or repairs made to insure compliance with the lighting requirements.

§3.682 *Logs, retention of.*—Logs of television broadcast stations shall be retained by the licensee for a period of 2 years. However, logs incident to or involved in any claim or complaint of which the licensee has notice shall be retained by the licensee until such claim or complaint has been fully satisfied or until the same has been barred by statute limiting the time for the filing of suits upon such claims.

§3.683 *Logs, by whom kept.*—Each log shall be kept by the person or persons competent to do so, having actual knowledge of the facts required, who shall sign the log when starting duty and again when going off duty. The logs shall be made available upon request by an authorized representative of the Commission.

§3.684 *Log form.*—The log shall be kept in an orderly manner, in suitable form, and in such detail that the data required for the particular class of station concerned are readily available. Key letters or abbreviations may be used if proper meaning or explanation is contained elsewhere in the log.

§3.685 *Correction of logs.*—No log or portion thereof shall be erased, obliterated, or wilfully destroyed within the period of retention provided by the rules. Any necessary correction may be made only by the person originating the entry who shall strike out the erroneous portion, initial the correction made, and indicate the date of correction.

§3.686 *Rough logs.*—Rough logs may be transcribed into condensed form, but in such case, the original log or memoranda and all portions thereof shall be preserved and made a part of the complete log.

§3.687 *Station identification.*—(a) A licensee of a television broadcast station shall make station identification announcement (call letters and location), at the beginning and ending of each time of operation and during the operation on the hour. The announcement at the beginning and ending of each time of operation shall be by both aural and visual means. Other announcements may be by either aural or visual means.

(b) Identification announcements during operation need not be made when to make such announcement would interrupt a single consecutive speech, play, religious service, symphony concert, or any type of production. In such cases the identification announcement shall be made at the first interruption of the entertainment continuity and at the conclusion thereof.

§3.688 *Mechanical reproductions.*—(a) Each program which consists in whole or in part of one or more mechanical reproductions, either visual or aural, shall be accompanied by an appropriate announcement to that effect either at the beginning or end of such reproduction or at the beginning or end of the program in which such reproduction is used. No such announcement shall be required where a mechanical reproduction is used for background music, sound effects, station identification, program identification (theme music of short duration) or identification of sponsorship of the program proper.

(b) The exact form of identifying announcement is not prescribed, but the language shall be clear and in terms commonly used and understood. The licensee shall not attempt affirmatively to create the impression that any program being broadcast by mechanical reproduction consists of live talent.

§3.689 *Sponsored programs, announcement of.*—(a) In the case of each program for the broadcasting of which money, services, or other valuable consideration is either directly or indirectly paid or promised to, or charged or received by, any radio broadcast station, the station broadcasting such program shall make, or cause to be made, an appropriate announcement that the program is sponsored, paid for, or furnished, either in whole, or in part.

(b) In the case of any political program or any program involving the discussion of public controversial issues for which any films, records, transcriptions, talent, scripts, or other material or services of any kind are furnished, either directly or indirectly, to a station as an inducement to the broadcasting of such program, an announcement shall be made both at the beginning and conclusion of such program on which such material or services are used that such films, records, transcriptions, talent, scripts, or other material or services have been furnished to such station in connection with the broadcasting of such program; *provided, however,* that only one such announcement need be made in the case of any such program of five minutes' duration or less, which announcement may be made either at the beginning or conclusion of the program.

(c) The announcement required by this section shall fully and fairly disclose the true identity of the person or persons by whom or in whose behalf such payment is made or promised, or from whom or in whose behalf such services or other valuable consideration is received, or by whom the material or services referred to in subsection (b) hereof are furnished. Where an agent or other person contracts or otherwise makes arrangements with a station on behalf of another, and such fact is known to the station, the announcement shall disclose the identity of the person or persons in whose behalf such agent is acting instead of the name of such agent.

(d) In the case of any program, other than a program advertising commercial

products or services, which is sponsored, paid for or furnished, either in whole or in part, or for which material or services referred to in subsection (b) hereof are furnished, by a corporation, committee, association or other unincorporated group, the announcement required by this section, shall disclose the name of such corporation, committee, association or other unincorporated group. In each such case the station shall require that a list of the chief executive officers or members of the executive committee or of the board of directors of the corporation, committee, association or other unincorporated group shall be made available for public inspection at one of the television broadcast stations carrying the program.

(e) In the case of programs advertising commercial products or services, an announcement stating the sponsor's corporate or trade name or the name of the sponsor's product, shall be deemed sufficient for the purposes of this section and only one such announcement need be made at any time during the course of the program.

§3.690 *Broadcasts by candidates for public office.*—(a) *Legally qualified candidate.*—A "legally qualified candidate" means any person who has publicly announced that he is a candidate for nomination by a convention of a political party or for nomination or election in a primary, special, or general election, municipal, county, state or national, and who meets the qualifications prescribed by the applicable laws to hold the office for which he is a candidate, so that he may be voted for by the electorate directly or by means of delegates or electors, and who

(1) has qualified for a place on the ballot or

(2) is eligible under the applicable law to be voted for by sticker, by writing in his name on the ballot, or other method, and (i) has been duly nominated by a political party which is commonly known and regarded as such, or (ii) makes a substantial showing that he is a *bona fide* candidate for nomination or office, as the case may be.

(b) *General requirements.*—No station licensee is required to permit the use of its facilities by any legally qualified candidate for public office, but if any licensee shall permit any such candidate to use its facilities, it shall afford equal opportunities to all other such candidates for that office to use such facilities, *Provided,* That such licensee shall have no power of censorship over the material broadcast by any such candidate.

(c) *Rates and practices.*—The rates, if any, charged all such candidates for the same office shall be uniform and shall not be rebated by any means, directly or indirectly; no licensee shall make any discrimination in charges, practices, regulations, facilities, or services for or in connection with the service rendered pursuant to these rules, or make or give any preference to any candidate for public office or subject any such candidate to any prejudice or disadvantage; nor shall any licensee make any contract or other agreement which shall have the effect of permitting any legally qualified candidate for any public office to broadcast to the exclusion of other legally qualified candidates for the same public office.

(d) *Inspection of records.*—Every licensee shall keep and permit public inspection of a complete record of all requests for broadcast time made by or on behalf of candidates for public office, together with an appropriate notation showing the disposition made by the licensee of such requests, and the charges made, if any, if request is granted.

§3.691 *Rebroadcast.*—(a) The term "rebroadcast" means reception by radio of the program¹ of a radio station, and the simultaneous or subsequent retransmission of such program by a broadcast station. The broadcasting of a program relayed by a relay broadcast station or studio transmitter link is not considered a rebroadcast.

(b) The licensee of a television broadcast station may, without further authority of the Commission, rebroadcast the program of a United States television broadcast station, provided the Commission is notified of the call letters of each station rebroadcast and the licensee certifies that express authority has been received from the licensee of the station originating the program.²

(c) No licensee of a television broadcast station shall rebroadcast the program of any United States radio station not designated in (b) above without written authority having first been obtained from the Commission upon application (informal) accompanied by written consent or certification of consent of the licensee of the station originating the program.³

Part 4.—RULES GOVERNING BROADCAST SERVICES OTHER THAN STANDARD BROADCAST

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¹ As used in this section, program includes any complete program or part thereof.

² The notice and certification of consent shall be given within three (3) days of any single rebroadcast, but in case of the regular practice of rebroadcasting certain programs of a television broadcast station several times during a license period, notice and certification of consent shall be given for the ensuing license period with the application for renewal of license, or at the beginning of such rebroadcast practice if begun during a license period.

³ By Order No. 82, dated and effective June 24, 1941, until further order by the Commission, section 3.691 (d) is suspended only insofar as it requires prior written authority of the Commission for the rebroadcasting of programs originated for that express purpose by United States Government radio stations.

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IN GENERAL

§4.1 Frequency tolerance.—The operating frequency of the broadcast stations as listed below shall be maintained within plus or minus the percentage of the assigned frequency as given in table I.

TABLE I

Class of station	Frequency tolerance
Relay broadcast station:	
(a) 1622 to 2830 kc	0.04 percent.
(b) 30000 to 40000 kc and above	10 watts or less, 0.1 percent. Above 10 watts, 0.05 percent.
ST broadcast station	0.01 percent.
International broadcast station	0.005 percent. ¹
Television broadcast station	0.01 percent.
Facsimile broadcast station	0.05 percent or less as required.
High frequency broadcast station	0.01 percent.
Noncommercial educational broadcast station	Do.
Developmental broadcast station	0.05 percent or less as required.

§4.2 Frequency monitors.—(a) The licensee of each broadcast station listed in section 4.1 except relay broadcast stations, shall operate at the transmitter a frequency monitor independent of the frequency control of the transmitter.

(b) The frequency monitor shall be designed and constructed in accordance with good engineering practice and shall have an accuracy sufficient to determine that the operating frequency is within one-half (½) of the allowed tolerance.

(c) The licensee of each relay broadcast station shall provide the necessary means for determining that the frequency of the station is within the allowed tolerance.

(d) The frequency of all stations listed in section 4.1 shall be checked at each time of beginning operation and as often thereafter as necessary to maintain the frequency within the allowed tolerance.

§4.3 License period; renewal^{1a}—(a) Licenses for the following classes of

¹ Tolerance may be 0.01 percent on equipment installed prior to January 1, 1940, and until January 1, 1941, when all international stations shall maintain frequency within 0.005 percent of the assigned frequency.

^{1a} Order No. 110-A, dates and effective September 11, 1945, suspends, until further order of the Commission, that portion of this section which established for international broadcast stations a normal license term of one year and ordered: "The license term for every international broadcast station, shall end at the earlier of the following dates: (a) April 1, 1946, or (b) the first day on which its operations are not controlled, by agreement or otherwise, by the Office of War Information or the Coordinator of Inter-American Affairs, or other governmental agency supervising the operation of international broadcasting."

broadcast stations normally will be issued for a period of 1 year expiring as follows:²

(b) Licenses for relay broadcast and special relay broadcast stations authorized under section 4.22 of the Rules and Regulations will be issued for a period running concurrently with the license of the broadcast station with which it is to be used.

(c) Each licensee shall submit the application for renewal of license at least 60 days prior to the expiration date (Section 1.360).

(d) A supplemental report shall be submitted with each application for renewal of license of a station licensed experimentally³ in accordance with the regulations governing each class of station.

§4.4 Requirements, limitations, and restrictions.—(a) No station licensed experimentally will be assigned for exclusive use of any frequency. In case interference would be caused by simultaneous operation of stations licensed experimentally, such licensees shall endeavor to arrange satisfactory time division. If such agreement cannot be reached, the Commission will determine and specify the time division.

(b) The Commission may from time to time require that a station licensed experimentally conduct such experiments that are deemed desirable and reasonable for the development of the service.

(c) The program of research and experimentation as offered by an applicant in compliance with the requirements for obtaining a license for an experimental station³ shall be adhered to in the main, unless the licensee is authorized to do otherwise by the Commission.

(d) A licensee of an experimental station is not required to adhere to a regular schedule of operation but shall actively conduct a program of research and experimentation or transmission of programs: *Provided, however*, Licensees of developmental broadcast stations which are licensed to conduct special intermittent experiments, such as to develop and test commercial broadcast equipment, are required to operate only when there is a need therefor.

(e) A supplementary statement shall be filed with and made a part of each application for construction permit for any broadcast station on an experimental basis which specifies any frequency above 300000 kilocycles or in the bands 162000 to 168000, 210000 to 216000, and 264000 to 270000 kilocycles except television, confirming the applicant's understanding:

- (1) That all operation upon the frequency is experimental only,
- (2) That the frequency may not be the best suited to the particular experimental work to be carried on, and
- (3) That the frequency may not be allocated for the service that may be developed experimentally.

§4.5 Station records.—(a) The licensee of each class of broadcast station listed in section 4.1 shall maintain adequate records of the operation, including:

- (1) Hours of operation.
- (2) Program transmitted.
- (3) Frequency check.
- (4) Pertinent remarks concerning transmission.
- (5) In case of relay station, an entry giving point of program origination and receiver location shall be included.

(6) Research and experimentation conducted in case of an experimental station.

(7) And any additional information specified in the regulations governing each class of station or for completing the supplemental report as required.

(b) Where an antenna or antenna supporting structure (s) is required to be illuminated the licensee shall make entries in the radio station log appropriate to the requirements of section 2.82 (a), (b), and (c) as follows:

- (1) The time the tower lights are turned on and off if manually controlled.
- (2) The time the daily visual observation of the tower lights was made.
- (3) In the event of any observed failure of a tower light.
 - (i) Nature of such failure.
 - (ii) Time the failure was observed.
 - (iii) Time and nature of the adjustments, repairs or replacements made.
 - (iv) Airways Communication Station (C.A.A.) notified of the failure of any tower light not corrected within thirty minutes and the time such notice was given.

(v) Time notice was given to the Airways Communication Station (C.A.A.) that the required illumination was resumed.

(4) Upon completion of the periodic inspection required at least once each three months,

(i) The date of the inspection and the condition of all tower lights and associated tower lighting control devices.

(ii) Any adjustments, replacements or repairs made to insure compliance with the lighting requirements.

§4.6 Equipment changes.—The licensee of each class of broadcast station listed in section 4.1 may make any changes in the equipment that are deemed desirable or necessary. *Provided:*

- (a) That the operating frequency is not permitted to deviate more than the allowed tolerance;
- (b) That the emissions are not permitted outside the authorized band;
- (c) That the power output complies with the license and the regulations governing the same; and
- (d) That the transmitter as a whole or output power rating of the transmitter is not changed.

² Licenses will be renewed according to the schedules set out in these rules upon the expiration of existing licenses.

Class of station	Date of expiration
ST broadcast station	Apr. 1
International broadcast station	Nov. 1
Television broadcast station	Feb. 1
Facsimile broadcast station	Mar. 1
High frequency broadcast station	Apr. 1
Noncommercial educational broadcast station	May 1
Developmental broadcast station	May 1

³ The phrases "station licensed experimentally" and "experimental station" are used interchangeably and refer to stations listed in section 4.3 when so specified in the instrument of authorization.

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§4.7 Emission authorized.—All classes of broadcast licenses authorize A3 emission only unless otherwise specified in the license. In case A1, A2, A4, A5, or special emission are necessary or helpful in carrying on any phases of experimentation, application setting out fully the needs shall be made to, and authority therefor received from, the Commission.

§4.8 Additional orders, as needed.—In case all the general rules and regulations and the specific rules governing each class of broadcast station do not cover all phases of operation or experimentation with respect to external effects, the Commission may make supplemental or additional orders in each case as deemed necessary for operation in the public interest, convenience, and/or necessity.

§4.9 Operation.—A licensed operator shall be on duty and in charge of the transmitter of each broadcast station listed in section 4.1. In no case will remote-control operation be authorized. A transmitter is not considered as being operated by remote control when the following conditions prevail:

(a) Continuous reading indicating instruments are before the operator as follows:

- (1) Frequency deviation meter.
- (2) Percentage modulation indicator.
- (3) Spurious emission check (receiver).
- (4) Last radio stage plate voltage.
- (5) Last radio stage total plate current.
- (6) Output or antenna current.

(b) The operator has off-and-on control of the power to the last radio stage.
(c) The operator can reach the transmitter proper in not more than 5 minutes to make any changes or adjustments necessary to maintain proper operation.

§4.10 Rebroadcasts.⁴—(a) The licensee of an international or noncommercial educational broadcast station may, without further authority of the Commission, rebroadcast the program of a United States standard broadcast station, provided the Commission is notified of the call letters of each station rebroadcast and the licensee certified that express authority has been received from the licensee of the station originating the program.⁵ (See section 4.43 and 4.132 (c) concerning commercial announcements.)

(b) No licensee of an international broadcast station shall rebroadcast the programs of any other class of United States radio station without written authority having first been obtained from the Commission.^{6, 7}

(c) The licensee of a noncommercial educational broadcast station may, without further authority of the Commission, rebroadcast the noncommercial programs of a standard broadcast station or an international broadcast station, provided the Commission is notified of the call letters of each station rebroadcast and the licensee certifies that express authority has been received from the licensee of the station originating the program.

(d) No licensee of any other class of broadcast station listed in section 4.1 (television, facsimile, high frequency or developmental) shall rebroadcast the program of any radio station without written authority first having been obtained from the Commission.⁷

(e) A licensee of an international broadcast station may authorize the rebroadcast of its programs by any station outside the limits of the North American Continent without permission from the Commission: *Provided*, That the station rebroadcasting the programs cannot be received consistently in the United States.

(f) An application for authority to rebroadcast the program of any radio station shall be accompanied by written consent or certification of consent of the licensee of the station originating the program.

§4.11 Equipment and program tests.—(a) A licensee of a broadcast station listed in section 4.1 shall conduct equipment tests in accordance with section 2.42 and program tests in accordance with section 2.43.

(b) In case the transmitter and associated equipment are on hand in complete form and an application for license was filed and granted with the application for construction permit, then the notification of equipment tests and program tests as required by paragraph (a) of this section need not be made.

§4.12 Station and operator licenses; posting of.—(a) The station license and any other instrument of authorization or individual order concerning the construction of the equipment or manner of operation of the station shall be posted so that all terms thereof are visible in a conspicuous place in the room in which the transmitter is located: *Provided*:

(1) If the transmitter operator is located at a distance from the transmitter pursuant to section 4.9, the station license shall be posted in the above-described manner at the operating position.

(2) If the station is licensed for portable-mobile operation, the station license or a photo copy thereof shall be affixed to the equipment or kept in the possession of the operator on duty at the transmitter. If a photo copy is used the original license shall be available for inspection by an authorized government representative.

(b) The license of each station operator (s) shall be conspicuously posted at the operating position. *Provided*:

(1) If the station at which the operator is on duty is licensed for portable-mobile operation, the operator's license may be kept in his personal possession.

RELAY BROADCAST STATIONS

§4.21 Defined.⁸—The term "relay broadcast station" means a station

⁴ For definition of "rebroadcast" see 3.94 (a).

⁵ The notice and certification of consent must be given within three (3) days of any single rebroadcast, but in case of the regular practice of rebroadcasting certain programs of a standard broadcast station several times during a license period, notice and certification of consent must be given for the ensuing license period with the application for renewal of license, or at the beginning of such rebroadcast practice if begun during a license period.

⁶ The broadcasting of a program relayed by a relay broadcast station (section 4.21) is not considered a rebroadcast.

⁷ Informal application may be employed.

⁸ See section 4.5 (a) (6) for special log entry requirements.

⁹ By Order No. 82, dated and effective June 24, 1941, until further order of the Commission, this section is suspended "only insofar as it precludes by definition the use of a relay broadcast station where wire facilities are available for the transmission of programs from points under the jurisdiction of the military or naval establishments of the United States, where the broadcasting of such programs has been requested by the appropriate establishment."

licensed to transmit from points where wire facilities are not available, programs for broadcast by one or more broadcast stations, or orders concerning such programs.

§4.22 Licensing and authorizations.—(a) A license for a relay broadcast station will be issued only to the licensee of a standard broadcast station: *Provided, however*, In cases where it is impractical, impossible, or prohibited by laws or regulations for the licensee of a standard broadcast station to install, operate, or maintain the necessary equipment under its legal control, the Commission may grant special temporary authority for each event to another person to operate as a relay broadcast station equipment already licensed for another service, or equipment which may be installed under section 319 (b) of the Communications Act of 1934 without a construction permit: *And provided further*:

(b) The Commission may license a special relay broadcast station to the licensee of another class of broadcast station provided a need therefor is shown and the relay station will be used only for relaying of programs for broadcast by such broadcast station.

(c) The license of a relay broadcast station authorized the transmission of commercial or sustaining programs, or orders concerning such programs, to be broadcast by its standard broadcast station and other broadcast stations transmitting the same programs simultaneously or a chain program to the network with which the licensee is regularly affiliated. The license of a relay station does not authorize transmission of programs to be broadcast solely by other broadcast stations not aforementioned.

(d) In case a licensee has two or more standard broadcast stations located in different cities, it shall, in applying for a new relay station or for renewal of license of an existing relay station, designate the standard broadcast station or stations in conjunction with which the relay station is to be operated principally, and is shall not thereafter operate the relay station in conjunction with another of its standard broadcast stations located in a different city for more than a total of 10 days in any 30-day period.

(e) Each application for temporary authority to operate a relay broadcast station from a person other than a licensee of a standard broadcast station shall be accompanied by an application for authority to broadcast the program from the licensee of the standard broadcast station proposing the broadcast.

(f) An application for special temporary authority to operate another class of station as a relay broadcast station shall specify a group of frequencies allocated in section 4.23: *Provided, however*, In case of events of national interest and importance which cannot be transmitted successfully to the nearest available wire facilities on these frequencies, other frequencies under the jurisdiction of the Commission may be requested, if it is shown that the operation thereon will not cause interference to established stations.

(g) An application for special temporary authority to operate on frequencies not allocated by section 4.23, or to operate another class of station as a relay broadcast station, must be received by the Commission not less than 10 days prior to the actual event to be broadcast, and shall contain complete information concerning the frequencies requested, and the license of the station to be used. In case of emergencies, which shall be fully explained in the application, the Commission may waive the 10-day requirement specified herein.

§4.23 Frequency assignment and operation.—(a) The following groups of frequencies are allocated for assignment to relay broadcast stations:

Group A Kilocycles	Group B Kilocycles	Group C Kilocycles	Group D Kilocycles	Group E Kilocycles
1622	1606	1646	30820	31220
2058	¹⁰ 2074	2090	33740	35620
2150	2102	2190	35820	37020
2790	2758	2830	37980	39260
Group F Kilocycles	Group G Kilocycles	Group H Kilocycles	Group I Kilocycles	Group J
31620	33380	156075	156750	Any 4 frequencies above 300000 kc. excluding band 400000 to 401000 kc.
35260	35020	157575	158400	
37340	37620	159975	159300	
39620	39820	161925	161100	

(b) One of the above groups only, including all four frequencies, will be assigned each station. The first application from any metropolitan area for the frequencies in groups A, B, or C shall specify group A; the second group B, and the third group C, the fourth group A again, etc., and likewise for frequencies in groups D, E, F, or G. First application group D, second E, third F, etc. Outstanding assignments not following this order will not be changed unless a need therefor develops. Additional applicants shall specify the next unassigned group in sequence or any other group if it appears interference will be avoided thereby.

(c) A station may be licensed for group H when a need for frequencies of this order may be shown.

(d) Group I will be licensed to stations to operate with frequency modulation only when need for such operation and frequencies of this order may be shown.

(e) Any four specific frequencies under group J will be assigned on experimental operation only and an applicant may apply for the four frequencies which appear most suitable for the experimental work to be conducted.

(f) The licensee of a station on group J shall carry on research and experimentation for the advancement of the relay broadcast art and development of these ultra high frequencies for relay broadcast services. An application for authority to operate a station on frequencies in group J shall include a statement concerning the research and experiments to be conducted. The research and experiments shall indicate reasonable promise of substantial contribution to the development of the program relay services.

(g) A license authorizes operation on only one of the four assigned frequencies at any one time. In case it is desired to transmit programs and spoken orders concerning such programs simultaneously, two licenses are required though each may specify the same group of frequencies.

§4.24 Frequency selection to avoid interference.—In case two or more stations are licensed for the same group of frequencies in the same area and in case simultaneous operation is contemplated, the licensees shall endeavor to select frequencies to avoid interference. If a mutual agreement to this effect

⁹ See "Number of Relay Broadcast Stations That Will Be Licensed to Each Holder of Standard Broadcast Station License" as announced by the Commission.

¹⁰ Subject to the condition that no interference is caused to Government stations on adjacent channels.

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cannot be reached the Commission shall be notified and it will specify the frequencies on which each station is to be operated.

§4.25 Power limitations.—(a) A relay broadcast station assigned frequencies in groups A, B, C, and J will be licensed to operate with a power output not in excess of that necessary to transmit the program and orders satisfactorily to the receivers and shall not be operated with a power greater than licensed.

(b)¹¹ A relay broadcast station assigned frequencies in groups D, E, F, and G will not be authorized to install equipment or licensed for an output power in excess of 100 watts; *Provided*, That before using any frequency in these groups with a power in excess of 25 watts, tests shall be made by the licensee to insure that no objectionable interference will result to the service of any government station, *And provided further*, That if the use of any frequency may cause interference then the power shall be reduced to 25 watts or another frequency in the licensed group selected which will not cause objectionable interference.

(c)¹² A relay broadcast station assigned frequencies in groups H and I will be licensed to operate with a power output not in excess of that necessary to transmit the program and orders satisfactorily to the receivers and shall not be operated with a power greater than that licensed. In event interference may be caused to stations on adjacent channels, licensees shall endeavor to make arrangements to reduce power to a point where interference will not be objectionable. If a satisfactory arrangement cannot be agreed upon the Commission will determine and specify the maximum power or conditions of operation of each such station.

§4.26 Supplemental report with renewal application.—The licensee of a relay broadcast station assigned frequencies under group J shall submit a supplemental report with and made a part of each application for renewal of license as follows:

- Number of hours operated for experimental purposes.
- Developments carried on in the relay broadcast service.
- Propagation characteristics of the frequencies assigned with regard to relay broadcast service.
- All developments or major changes in equipment.¹³
- Any other pertinent developments.

§4.27 Station identification.—Each relay broadcast station shall announce its call letters at the beginning and end of each period of operation, and during operation, at least once every hour it either shall announce its call letters or shall make an announcement which will permit it to be identified.

RULES GOVERNING ST BROADCAST STATIONS

§4.31 Defined.—The term "ST¹³ broadcast station" means a station used to transmit programs from the main studio to the transmitter of a high frequency broadcast station, or an international broadcast station.

§4.32 Licensing requirements.—An ST broadcast station will be licensed only to the licensee of a high frequency broadcast station or of an international broadcast station. Only one ST broadcast station will be authorized in connection with the license for any high frequency broadcast station. Not more than two ST broadcast stations will be authorized in connection with the license for any international broadcast station. Each such ST station shall be at a fixed location.

§4.33 Service.—The license of an ST broadcast station authorizes the transmission of program material, including commercial programs, from the main studio to the transmitter of the high frequency broadcast station or international broadcast station in connection with which it is authorized.

§4.34 Frequency assignment and operation.—(a) The following frequencies are allocated for assignment to ST broadcast stations upon an experimental basis

Kilocycles	Kilocycles	Kilocycles	Kilocycles	Kilocycles
330400	333400	336400	339400	342400
331000	334000	337000	340000	343000
331600	334600	337600	340600	343600
332200	335200	338200	341200	
332800	335800	338800	341800	

(b) ST broadcast stations will be authorized to employ frequency modulation only.

(c) The maximum frequency swing employed by ST broadcast stations shall not be in excess of 200 kilocycles.

(d) The licensee of each ST broadcast station shall install and operate a directional antenna designed so that the gain in power toward the receiver shall be 10 (field gain 3.16) times the free space field from a doublet (137.6 mv/m for 1 kw at 1 mile). In all other directions 30° or more off the line to receiver, the power gain shall not exceed one-fourth the free space field gain from a doublet.

§4.35 Power.—ST broadcast station will be licensed with a power output not in excess of that necessary to render a satisfactory service.

§4.36 Required experimentation.—The licensee of each ST broadcast station is required to conduct experimentation with regard to the following:

- Design of equipment and power required to render a satisfactory service.
- Design and adjustment of directional transmitting antenna.
- Design and location of receiving antennas.

§4.37 Supplemental report with renewal application.—A supplemental report shall be filed with and made a part of each application for renewal of application and shall include statements as to the following items:

- Total hours of operation.
- Continuity of service, causes and duration of any interruptions.
- Power required to deliver satisfactory signal at receiver.
- Data on design, adjustments, and operation of directional receiving and transmitting antennas.

- Interference to service resulting from other stations or other sources.
- Cost of transmitter and receiver installation and expense of operation.
- Over-all fidelity of equipment, frequency and amplitude.

§4.38 Station identification.—Each ST broadcast station shall announce its call letters at the beginning and end of each period of operation, and during operation, at least once every hour it either shall announce its call letters or shall make an announcement which will permit it to be identified.

INTERNATIONAL BROADCAST STATIONS

§4.41 Defined.—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 6000 and 26600 kilocycles] for broadcasting by international agreement.)

§4.42 Licensing requirements; necessary showing.—A license for an international broadcast station will be issued only after a satisfactory showing has been made in regard to the following, among others:

- That there is a need for the international broadcast service proposed to be rendered.
- That the necessary program sources are available to the applicant to render an effective international service.
- That the technical facilities are available on which the proposed service can be rendered without causing interference to established international stations having prior registration and occupancy in conformity with existing international conventions or regulations on the frequency requested.¹⁴
- That directive antennas and other technical facilities will be employed to deliver maximum signals to the country or countries for which the service is designed.
- That the production of the program service and the technical operation of the proposed station will be conducted by qualified persons.
- That the applicant is technically and financially qualified and possesses adequate technical facilities to carry forward the service proposed.
- That the public interest, convenience and necessity will be served through the operation of the proposed station.

§4.43—Service; commercial or sponsored programs.—(a)¹⁵ A licensee of an international broadcast station shall render only an international broadcast service which will reflect the culture of this country and which will promote international goodwill, understanding, and cooperation. Any program solely intended for, and directed to an audience in the continental United States does not meet the requirements for this service.

(b) Such international broadcast service may include commercial or sponsored programs: *Provided*, That—

- Commercial program continuities give no more than the name of the sponsor of the program and the name and general character of the commodity, utility or service, or attraction advertised.
- In case of advertising a commodity, the commodity is regularly sold or is being promoted for sale on the open market in the foreign country or countries to which the program is directed in accordance with paragraph (c) of this section.
- In case of advertising an American utility or service to prospective tourists or visitors to the United States, the advertisement continuity is particularly directed to such persons in the foreign country or countries where they reside and to which the program is directed in accordance with paragraph (c) of this section.

(4) In case of advertising an international attraction (such as a world fair, resort, spa, etc.) to prospective tourists or visitors to the United States, the oral continuity concerning such attraction is consistent with the purpose and intent of this section.

(5) In case of any other type of advertising, such advertising is directed to the foreign country or countries and to which the program is directed in accordance with paragraph (c) of this section and is consistent with the purpose and intent of this section.

(c) The areas or zones established to be served by international broadcast stations are the foreign countries of the world, and directive antennas shall be employed to direct the signals to specific countries. The antenna shall be so designed and operated that the signal (field intensity) toward the specific foreign country or countries served shall be at least 3.16 times the average effective signal from the station (power gain of 10).

(d) An international broadcast station may transmit the program of a standard broadcast station or network system: *Provided*, The conditions in paragraph (b) of this section in regard to any commercial continuities are observed and when station identifications are made, only the call letter designation of the international station is given on its assigned frequency: *And provided further*, That in the case of chain broadcasting¹⁶ the program is not carried simultaneously by another international station (except another station owned by the same licensee operated on a frequency in a different group to obtain continuity of signal service), the signals from which are directed to the same foreign country or countries.

(e) Station identification, program announcements, and oral continuity shall be made with international significance (language particularly) which is designed for the foreign country or countries for which the service is primarily intended.

¹⁴ See General Radio Regulations annexed to the International Telecommunications Convention, Madrid, 1932, art. 7. Prior to September 1, 1939, and thereafter see Cairo General Radio Regulations, art. 7, annexed to the International Telecommunications Conferences, Cairo, Egypt, 1938. Also, see list of assignments to international channels prepared by the Bureau of the International Telecommunications Union, Berne, Switzerland.

¹⁵ The Commission on July 14, 1939, suspended the operation of section 4.43 (a) until further order of the Commission.

¹⁶ See sec. 3 (p) of the Communications Act of 1939 for the definition of "chain broadcasting".

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¹¹ As amended by the Commission, effective November 7, 1939.

¹² As amended by the Commission, effective July 12, 1939.

¹³ The abbreviation "ST" is derived from "studio-transmitter."

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(f)^{16a} Each licensee of an international broadcast station shall make verbatim mechanical records of all international programs transmitted.

(2) The mechanical records, and such manuscripts, transcripts, and translations of international broadcast programs as are made shall be kept by the licensee for a period of two years after the date of broadcast and shall be furnished the Commission or be available for inspection by representatives of the Commission upon request.

(3) If the broadcast is in a language other than English the licensee shall furnish to the Commission upon request such record and scripts together with complete translations in English.

§4.44 *Frequency assignment.*—(a) The following groups of frequencies are allocated for assignment to international broadcast stations:

Group A Kilocycles	Group B Kilocycles	Group C Kilocycles	Group D Kilocycles
6040	9530	11710	¹⁷ 15130
6060	^{17 18} 9550	^{17 18} 11730	15150
6080	9570	11790	15210

Group A Kilocycles	Group B Kilocycles	Group C Kilocycles	Group D Kilocycles
6100	9590	11820	15250
¹⁷ 6120	9650	11830	15270
6140	9670	11870	15330
6170		11890	15350
6190			
7805			
7935			

Group E Kilocycles	Group F Kilocycles	Group G Kilocycles
17750	21460	25600
17750	^{17 18} 21500	25625
17780	21520	25650
17800	21540	25675
17830	21570	25700
	21590	25725
	21610	25750
	21630	25775
	21650	25800
		25825
		25850

(b) Additional frequencies allocated by international agreement may be assigned to international broadcast stations subject to the conditions that no objectionable interference results to the service of foreign international broadcast stations which, in the opinion of the Commission, have priority of assignment.

(c) Any frequency licensed to an international broadcast station shall also be available for assignment to other international broadcast stations, provided no objectionable interference is caused to the service of any United States international broadcast station.

(d)^{16a} An international broadcast station will not be authorized to use more than one frequency listed in any group listed in paragraph (a) without a showing of technical necessity.

(e)^{16a} Not more than one frequency shall be used simultaneously under the same authorization and call letter designation.

§4.45 *Power requirement.*—No international broadcast station will be authorized to install equipment or licensed for operation with a power less than 50 kilowatts.¹⁹

§4.46 *Supplemental report with renewal application.*—A supplemental report shall be filed with and made a part of each application for renewal of license and shall include statements of the following:

(a) The number of hours operated on each frequency.

(b) A list of programs transmitted of special international interest.

(c) Outline of reports of reception and interference and conclusions with regard to propagation characteristics of the frequency assigned.

§4.47 *Frequency control.*—The transmitter of each international broadcast station shall be equipped with automatic frequency control apparatus so designed and constructed that it is capable of maintaining the operating frequency within plus or minus 0.005 percent of the assigned frequency.²⁰

VISUAL BROADCAST SERVICE

§4.61 *Defined.*—The term "visual broadcast service" means a service rendered by stations broadcasting images for general public reception. There are two classes of stations recognized in the visual broadcast service, namely: Television broadcast stations and facsimile broadcast stations.

EXPERIMENTAL TELEVISION BROADCAST STATIONS

§4.71 *Defined.*—(a) The term "experimental television broadcast station" means a station licensed for experimental transmission of transient visual images of moving or fixed objects for simultaneous reception and reproduction by the general public.²¹

^{16a} Suspended until further order of the Commission by Order No. 108, dated and effective December 22, 1942.

¹⁷ Authorizations for international broadcast stations which permit operation on these frequencies shall be subject to the condition that the authorizations for these frequencies may be modified by the Commission to delete these frequencies without advance notice or hearing.

¹⁸ Authorizations for international broadcast stations which permit operation on these frequencies shall be subject to the condition that there shall be no commercial or advertising announcements of any kind in the programs broadcast through the medium of these frequencies, and that the names of program sponsors shall not be broadcast.

^{19a} Suspended until further order of the Commission by Order No. 108, dated and effective December 22, 1942.

¹⁹ This provision shall become effective as applying to existing stations July 1, 1941.

²⁰ See section 4.1. This provision shall become effective as applying to existing stations January 1, 1941.

²¹ The transmission of synchronized sound (aural broadcast) is considered an essential phase of television broadcast and one license will authorize both visual and aural broadcasts.

(b) Under these rules for experimental television broadcast stations, the Commission will authorize experimental television relay broadcast stations for transmitting from points where suitable wire facilities are not available, programs for broadcast by one or more television broadcast stations. Such authorization will be granted only to the licensee of a television broadcast station.

§4.72 *Purpose.*—A license for an experimental television broadcast station will be issued for the purpose of carrying on research and experimentation for the advancement of television broadcasting which may include tests of equipment, training of personnel, and experimental programs as are necessary for the experimentation.

§4.73 *Licensing requirements, necessary showing.*—A license for a television broadcast station will be issued only after a satisfactory showing has been made in regard to the following:

(1) That the applicant has a definite program of research and experimentation in the technical phases of television broadcasting, which indicates reasonable promise of substantial contribution to the developments of the television art.

(2) That upon the authorization of the proposed station the applicant can and will proceed immediately with its program of research and experimentation.

(3) That the transmission of signals by radio is essential to the proposed program of research and experimentation.

(4) That the program of research and experimentation will be conducted by qualified personnel.

(5) That the applicant is legally, financially, technically, and otherwise qualified to carry forward the program.

(6) That public interest, convenience or necessity will be served through the operation of the proposed station.

§4.74 *Charges.*—No charges, either direct or indirect, shall be made by the licensee of an experimental television station for the production or transmission of either aural or visual programs transmitted by such station except that this section shall not apply to the transmission of commercial programs by an experimental television relay broadcast station for retransmission by a television broadcast station.

§4.75 *Announcements.*—(a) *Station identification.*—A licensee of a television broadcast station shall make station identification announcement aurally and visually (call letters and location) at the beginning and ending of each time of operation and during operation on the hour.

(b) At the time station identification announcements are made there shall be added the following:

This is a special television broadcast made by authority of the Federal Communications Commission for experimental purposes.

§4.76 *Operating requirements.*—(a) Each licensee of a television broadcast station shall diligently prosecute its program of research from the time its station is authorized.

(b) Each licensee of a television station will, from time to time, make such changes in its operations as may be directed by the Commission for the purpose of promoting worthwhile experimentation and improvement in the art of television broadcasting.

§4.77 *Frequency assignment.*—(a) The following groups of channels are available for assignment to television broadcast stations licensed experimentally:

Group A		Group B		Group C
Chan- nel No.	Kilocycles	Chan- nel No.	Kilocycles	
1	50000-56000	8	162000-168000	Any 6000 kc. band above 300000 kc., excluding band 400000 to 401000 kc.
2	60000-66000	9	180000-186000	
3	66000-72000	10	186000-192000	
4	78000-84000	11	204000-210000	
5	84000-90000	12	210000-216000	
6	96000-102000	13	230000-236000	
7	102000-108000	14	236000-242000	
		15	258000-264000	
		16	264000-270000	
		17	282000-288000	
		18	288000-294000	

(b) No experimental television broadcast station will be authorized to use more than one channel in group A except for good cause shown. Both aural and visual carriers with side bands for modulation are authorized but no emission shall result outside the authorized channel.

(c) No persons (including all persons under common control) shall control directly or indirectly, two or more experimental television broadcast stations (other than television relay broadcast stations) unless a showing is made that the character of the programs of research require a licensing of two or more separate stations.

(d) A license for an experimental television broadcast station will be issued only on the condition that no objectionable interference will result from the transmissions of the station to the regular program transmissions of television broadcast stations. It shall at all times be the duty of the licensee of an experimental television broadcast station to ascertain that no interference will result from the transmissions of its station. With regard to interference with the transmissions of an experimental television broadcast station or the experimental or test transmissions of a television broadcast station, the licensees shall make arrangements for operations to avoid interference.

(e) Channels in groups B and C may be assigned to experimental television stations to serve auxiliary purposes such as television relay stations. No mobile or portable station will be licensed for the purpose of transmitting television programs to the public directly.

§4.78 *Power.*—The operating power of a television station shall be adequate for but not in excess of that necessary to carry forward the program of research and in no case in excess of the power specified in its license.

§4.79 *Reports.*—(a) A report shall be filed with each application for renewal of station license which shall include a statement of each of the following:

(1) Number of hours operated.

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- (2) Full data on research and experimentation conducted including the type of transmitting and studio equipment used and their mode of operation.
- (3) Data on expense of research and operation during the period covered.
- (4) Power employed, field intensity measurements and visual and aural observations and the types of instruments and receivers utilized to determine the service area of station and the efficiency of respective types of transmissions.
- (5) Estimated degree of public participation in reception and the results of observations as to the effectiveness of types of transmission.
- (6) Conclusions, tentative and final.
- (7) Program for further developments in television broadcasting.
- (8) All developments and major changes in equipment.
- (9) Any other pertinent developments.
- (b) Special or progress reports shall be submitted from time to time as the Commission shall direct.

FACSIMILE BROADCAST STATIONS

§4.91 Defined.—The term "facsimile broadcast station" means a station licensed to transmit images of still objects for record reception by the general public.

§4.92 Licensing requirements.—A license for a facsimile broadcast station will be issued only after a satisfactory showing has been made in regard to the following among others:

- (a) That the applicant has a program of research and experimentation which indicates reasonable promise of substantial contribution to the development of the facsimile broadcast service.
- (b) That sufficient facsimile recorders will be distributed to accomplish the experimental program proposed.
- (c) That the program of research and experimentation will be conducted by qualified engineers.
- (d) That the applicant is legally and financially qualified and possesses adequate technical facilities to carry forward the program.
- (e) That the public interest, convenience, and/or necessity will be served through the operation of the proposed station.

§4.93 Charges prohibited; restrictions.—(a) A licensee of a facsimile broadcast station shall not make any charge, directly or indirectly, for the transmission of programs.

(b) No licensee of any standard broadcast station or network shall make any additional charge, directly or indirectly, for the transmission of some phase of the programs by a facsimile broadcast station, nor shall commercial accounts be solicited by any licensee of a standard broadcast station or network, or others acting in their behalf, upon representation that images concerning that commercial program will be transmitted by a facsimile station.

§4.94 Frequency assignment.—(a) The following groups of frequencies are allocated for assignment to facsimile broadcast stations which will be licensed experimentally only:

Group A	Group B	Group C
<i>Kilocycles</i>	<i>Kilocycles</i>	Any frequency above 300000 kc. excluding band 400000 to 401000 kc.
25025	43540	
25050	43580	
25075	43620	
25100	43660	
25125	43700	
25150	43740	
25175	43780	
25200	43820	
25225	43860	
25250	43900	
	43940	

(b) Other broadcast or experimental frequencies may be assigned for the operation of facsimile broadcast stations on an experimental basis provided a sufficient need therefor is shown and no interference will be caused to established radio stations.

(c) One frequency only will be assigned to a facsimile station from the groups in paragraph (a) of this section. More than one frequency may be assigned under provisions of paragraph (b) of this section if a need therefor is shown.

(d) Each applicant shall specify the maximum modulating frequencies proposed to be employed.

(e) The operating frequency of a facsimile broadcast station shall be maintained in accordance with the frequency tolerance given in section 4.1: *Provided, however,* Where a lesser tolerance is necessary to prevent interference, the Commission will specify the tolerance.

(f) A facsimile broadcast station authorized to operate on frequencies regularly allocated to other stations or services shall be required to abide by all rules governing the stations regularly operating thereon, which are applicable to facsimile broadcast stations and are not in conflict with sections 4.1 to 4.11, inclusive, of these rules.

§4.95 Power.—The operating power of a facsimile broadcast station shall not be in excess of that necessary to carry forward the program of research: *Provided, however,* Not more than 1,000 watts will be authorized on a frequency in group A. The operating power may be maintained at the maximum rating or less, as the conditions of operation may require.

§4.96 Supplemental report with renewal application.—A supplemental report shall be filed with and made a part of each application for renewal of license and shall include statements of the following:

- (a) Number of hours operated for transmission of facsimile programs.
- (b) Comprehensive report of research and experimentation conducted.
- (c) Conclusions and program for further developments of the facsimile broadcast service.
- (d) All developments and major changes in equipment.
- (e) Any other pertinent developments.

HIGH FREQUENCY BROADCAST STATIONS

§4.111 Defined.—The term "high frequency broadcast station" means a station licensed on frequencies above 25000 kilocycles for transmission of aural programs for general public reception.

§4.112 Licensing requirements; necessary showing.—A license for a high frequency broadcast station will be issued only after a satisfactory showing has been made in regard to the following, among others:

(a) That the applicant has a program of research and experimentation which indicates reasonable promise of substantial contribution to the development of high frequency broadcasting.

(b) That substantial data will be taken on the propagation characteristics of these frequencies; on the noise level in different parts of the city; on the field intensity necessary to render good broadcast service; on antenna design and characteristics with respect to propagation; and on other allied phases of broadcast coverage.

(c) That the research and experimentation will be conducted by qualified engineers.

(d) That the applicant is legally and financially qualified and possesses adequate technical facilities to carry forward the program.

(e) That the public interest, convenience, and necessity will be served through the operation of the proposed station.

§4.113 Charges prohibited; restrictions and announcements.—(a) A licensee of a high frequency broadcast station shall not make any charge, directly or indirectly, for the transmission of programs, but may transmit the programs of a standard broadcast station or network including commercial programs, if the call letter designation when identifying the high frequency broadcast station is given on its assigned frequencies only and the statement is made over the high frequency broadcast station that the program of a standard broadcast station or network (identify by call letters or name of network) is being broadcast. Immediately following any announcement of the call letter designation of a standard broadcast station, the program from which is being broadcast over a high frequency broadcast station, the call letter designation of the high frequency broadcast station shall be given, in case of the rebroadcast of the program of any broadcast station, section 4.10 applies.

(b) No licensee of any standard broadcast station or network shall make any additional charge, directly or indirectly, for the simultaneous transmissions of programs by the high frequency broadcast station, nor shall commercial accounts be solicited by a licensee of a standard broadcast station or network, or by others acting in their behalf upon representation that the commercial program will also be transmitted by a high frequency broadcast station.

§4.114 Frequency assignment.—(a) The following groups of frequencies are allocated for assignment to high frequency broadcast stations:

Group A	Group B	Group C	Group D
<i>Kilocycles</i>	<i>Kilocycles</i>	<i>Kilocycles</i>	<i>Kilocycles</i>
25300	25900	26300	42060
25325	25925	26500	42100
25350	25950	26700	42140
25375	25975	26900	42180
25400	26000		42220
25425	26025		42260
25450	26050		42300
25475	26075		42340
25500	26100		42380
25525	26125		42420
25550	26150		42460

Group E	Group F	Group G	Group H
<i>Kilocycles</i>	<i>Kilocycles</i>	<i>Kilocycles</i>	Any frequency above 300000 kc., excluding band 400000 to 401000 kc.
42600	116590	117190	
42800	116710	117430	
43000	116830	117670	
43200	116950	117910	
43400	117070		

(b) A station assigned a frequency in group A, B, D, or F is authorized to operate exclusively with amplitude modulation (maximum band width of emission 30 kc). A station assigned a frequency in group C, E, or G is authorized to operate exclusively with frequency modulation (maximum band width of emission 200 kc). A station assigned a frequency in group H is authorized to operate with either amplitude or frequency modulation with the above band widths of emission as applicable.

(c) Stations serving the same area will not be assigned frequencies separated less than the following:

- Group A or B—100 kc.
- Group D—160 kc.
- Groups C, E, F, G, or H—To be determined.

(d) One frequency only in a group will be assigned to a station. A station assigned a frequency in group A, B, or C will not be assigned another frequency. A station assigned a frequency in group D may also be assigned a frequency in group F, and in group E, also in group G. In case more than one frequency is assigned to a station, the license authorizes operation on only one of the frequencies at one time.

(e) A licensee of a station assigned a frequency in group A or one of the last two frequencies in group C shall make the necessary observations to determine that no interference is caused to international mobile service and international fixed service respectively; and that the operation is in accordance with international agreements on the assignments of stations to this band. If interference is caused to such services the licensee may be required to reduce the operating power of the station or cease operation until the Commission deems no further interference will result.

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§4.115 Power.—(a) No high frequency broadcast station will be licensed show that greater power is needed to carry on a special program of research: for an output power rating greater than 1000 watts unless the applicant can *Provided, however*, in no case will an operating power greater than 1000 watts be authorized to a station assigned a frequency in group A or one of the last two frequencies in group C.

(b) While conducting apparatus experiments and in case adequate signal for reliable service can be delivered with less power, the operating output may be reduced accordingly.

§4.116 Frequency control.—Each high frequency broadcast station transmitter shall be equipped with automatic frequency control apparatus so designed and constructed that it is capable of maintaining the operating frequency within plus or minus 0.01 percent of the assigned frequency.

§4.117 Supplemental report with renewal application.—A supplemental report shall be filed with each and made a part of the application for renewal of license and shall include statements of the following, among others:

- (a) The number of hours operated.
- (b) Data taken in compliance with section 4.112 (b).
- (c) Outline of reports of reception and interference and conclusions with regard to propagation characteristics of the frequency assigned.
- (d) Research and experiments being carried on to improve transmission and to develop broadcasting on the very high frequencies.
- (e) All developments or major changes in equipment.
- (f) Any other pertinent developments.
- (g) Comprehensive summary of all reports received. See section 4.114 (e).

NONCOMMERCIAL EDUCATIONAL BROADCAST STATIONS

§4.131 Defined.—The term "noncommercial educational broadcast station" means a station licensed to an organized nonprofit educational agency for the advancement of its educational work and for the transmission of educational and entertainment programs to the general public.

§4.132 Operation and service.—The operation of, and the service furnished by, noncommercial educational broadcast stations shall be governed by the following regulations:

(a) A noncommercial educational broadcast station will be licensed only to an organized nonprofit educational agency and upon a showing that the station will be used for the advancement of the agency's educational program particularly with regard to use in an educational system consisting of several units.

(b) Each station may transmit programs directed to specific schools in the system for use in connection with the regular courses as well as routine and administrative material pertaining to the school system and may transmit educational and entertainment programs to the general public.

(c) Each station shall furnish a nonprofit and noncommercial broadcast service. No sponsored or commercial program shall be transmitted nor shall commercial announcements of any character be made. A station shall not transmit the programs of other classes of broadcast stations unless all commercial announcements and commercial references in the continuity are eliminated.

§4.133 Power.—The operating power of noncommercial educational broadcast stations shall be not less than 100 watts or greater than 1000 watts unless a definite need for greater power is shown.

§4.134 Frequency control.—The transmitter of each noncommercial educational broadcast station shall be equipped with automatic frequency control apparatus so designed and constructed that it is capable of maintaining the operating frequency within plus or minus 0.01 percent of the assigned frequency.

§4.135 Operating schedule.—Noncommercial educational broadcast stations are not required to operate on any definite schedule or minimum hours.

§4.136 Equipment requirements.—The transmitting equipment, installation, and operation as well as the location of the transmitter shall be in conformity with the requirements of good engineering practice as released from time to time by the Commission.

§4.137 Frequencies.—(a) The following frequencies are allocated for assignment to noncommercial educational broadcast stations: Kilocycles—42100, 42300, 42500, 42700, and 42900.

- (b) Stations serving the same area will not be assigned adjacent frequencies.
- (c) Frequency modulation shall be employed exclusively unless it is shown that there is a special need for the use of amplitude modulation.
- (d) Only one frequency will be assigned to a station.

DEVELOPMENTAL BROADCAST STATIONS

§4.151 Defined.—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.

§4.152 Licensing requirements: necessary showing.—(a) Licenses for developmental broadcast stations will be issued only after a satisfactory showing has been made in regard to the following, among others:

(1) That the applicant has program of research and development which cannot be successfully carried on under any of the classes of broadcast stations already allocated, or is distinctive from those classes, or combination of closely related developments that involve different phases of broadcasting which can be pursued better under one license.

(2) That the program of research has reasonable promise of substantial contribution to the development of broadcasting, or is along lines not already thoroughly investigated.

(3) That the program of research and experimentation will be conducted by qualified persons.

(4) That the applicant is legally and financially qualified and possesses adequate technical facilities to carry forward the program.

(5) That the public interest, convenience, and necessity will be served through the operation of the proposed station.

(b) A separate developmental broadcast station license will be issued for each major development proposed to be carried forward. When it is desired to carry on several independent developments, it will be necessary to make satisfactory showing and obtain a license for each.

§4.153 Program service; charges prohibited; announcements.—(a) A license of developmental broadcast stations shall broadcast programs when they are necessary to the experiments being conducted. No regular program service shall be broadcast unless specifically authorized by the license.

(b) A licensee of a developmental broadcast station shall not make any charge, directly or indirectly, for the transmission of programs, but may transmit the programs of a standard broadcast station or network including commercial programs, if the call letter designation when identifying the developmental broadcast station is given on its assigned frequency only and the statement is made over the developmental broadcast station that the program of a broadcast station or network (identify by call letters or name of network) is being broadcast in connection with the developmental work. In case of the rebroadcast of the program of any broadcast station, section 4.10 applies.

§4.154 Frequency assignment.—(a) The following frequencies are allotted for assignment to developmental broadcast stations:²²

1614		12855		116050
2396	} 2398	12870	} 12862.5	116250
2400				
3490		17300	} 17310	116850
3495	} 3492.5	17320		
4795			23100	
4800	} 4797.5	30660		117650
			31020	
6420	} 6425	31140		118250
6430			31180	
9130	} 9135	31540		118650
9140			33340	
		33460		156525
		33620		156975
		35060		157425
		35460		157725
		37060		158175
		37140		159075
		37570		160425
		39140		161325
		39460		161775
		39540		162000 to 168000
				210000 to 216000
				264000 to 270000
				300000 to 400000
				401000 and above

(b) A license will be issued for more than one of these frequencies upon a satisfactory showing that there is need therefor.

(c) The frequencies suited to the purpose and in which there appears to be the least or no interference to established stations shall be selected.

(d) In cases of important experimentation which cannot be conducted successfully on the frequencies allocated in paragraph (a) of this section, the Commission may authorize developmental broadcast stations to operate on any frequency allocated for broadcast stations or any frequencies allocated for other services under the jurisdiction of the Commission upon satisfactory showing that such frequencies can be used without causing interference to established services.

§4.155 Frequency tolerance.—(a) The operating frequency of a developmental broadcast station shall be maintained in accordance with the frequency tolerance given in section 4.1: *Provided, however*, Where lesser tolerance is necessary to prevent interference, the Commission will specify the tolerance.

(b) The operating power of a developmental broadcast station shall not be in excess of that necessary to carry on the program of research. The operating power may be maintained at the maximum rating or less, as the conditions of operation may require.

§4.156 Supplemental report with renewal application.—A supplemental report shall be filed with and made a part of each application for renewal of license and shall include statements of the following among others:

- (a) The number of hours operated.
- (b) Comprehensive report on research and experiments conducted.
- (c) Conclusions and program for further development of the broadcast service.
- (d) All developments and major changes in equipment.
- (e) Any other pertinent developments.

§4.157 Frequency restrictions.—A developmental broadcast station authorized to operate on frequencies regularly allocated to other stations or services, shall be required to abide by all rules governing the stations operating regularly thereon which are applicable to developmental broadcast stations and are not in conflict with section 4.1 to 4.11, inclusive, and sections 4.151 to 4.156, inclusive, of these rules.

²² Also available for assignment to all other stations in the experimental service.

FCC Standards of Good Engineering Practice Governing Television Broadcast Stations

1. Definitions

A. General

1. *Television Broadcast station.*—The term “television broadcast station” means a station in the television broadcast band transmitting simultaneous visual and aural signals intended to be received by the general public.
2. *Television broadcast band.*—The term “television broadcast band” means those frequencies in the band extending from 44 to 216 megacycles which are assignable to television broadcast stations. These frequencies are 44 to 50 megacycles (Channel No. 1), 54 to 72 megacycles (Channels 2 through 4), 76 to 88 megacycles (Channels 5 and 6), and 174 to 216 megacycles (Channels 7 through 13).
3. *Television channel.*—The term “television channel” means a band of frequencies 6 megacycles wide in the television broadcast band and designated either by number or by the extreme lower and upper frequencies.
4. *Television transmission standards.*—The term “television transmission standards” means the standards which determine the characteristics of the television signal as radiated by a television broadcast station. (See Section 2 A).
5. *Standard television signal.*—The term “standard television signal” means a signal which conforms with the television transmission standards.
6. *Television transmitter.*—The term “television transmitter” means the radio transmitter or transmitters for the transmission of both visual and aural signals.
7. *Antenna field gain.*—The term “antenna field gain” of a television antenna means the ratio of the effective free space field intensity produced at one mile in the horizontal plane expressed in millivolts per meter for 1 kilowatt antenna input power to 137.6 mv/m.
8. *Free space field intensity.*—The term “free space field intensity” means the field intensity that would exist at a point in the absence of waves reflected from the earth or other reflecting objects.
9. *Polarization.*—The term “polarization” means the direction of the electric vector as radiated from the transmitting antenna.

10. *Effective radiated power.*—The term “effective radiated power” means the product of the antenna power (transmitter output power less transmission line loss) times (1) the antenna power gain, or (2) the antenna field gain squared.
11. *Service area.*—The term “service area” as applied to television broadcasting means the service resulting from an assigned effective radiated power and antenna height above average terrain.
12. *Antenna height above average terrain.*—The term “antenna height above average terrain” means the average of the antenna heights above the terrain from two to ten miles from the antenna. (In general a different antenna height will be determined by each direction from the antenna. The average of these various heights is considered as the antenna height above average terrain.

B. Visual transmitter

1. *Visual transmitter.*—The term “visual transmitter” means the radio equipment for the transmission of the visual signal only.
2. *Amplitude modulation.*—The term “amplitude modulation” (AM) means a system of modulation in which the envelope of the transmitted wave contains a component similar to the wave form of the signal to be transmitted.
3. *Aspect ratio.*—The term “aspect ratio” means the numerical ratio of the frame width to frame height, as transmitted.
4. *Black level.*—The term “black level” means the amplitude of the modulating signal corresponding to the scanning of a black area in the transmitted picture.
5. *Color transmission.*—The term “color transmission” means the transmission of television signals which can be reproduced with different color values.
6. *Field frequency.*—The term “field frequency” means the number of times per second the frame area is fractionally scanned in the interlaced scanning.
7. *Frame.*—The term “frame” means one complete picture.
8. *Frame frequency.*—The term “frame frequency” means the number of times per second the picture area is completely scanned.
9. *Interlaced scanning.*—The term “interlaced scanning” means a scanning process in which successively scanned lines are spaced an integral number of line widths, and in which the adjacent lines are scanned during successive cycles of the field frequency scanning.
10. *Monochrome transmission.*—The term “monochrome transmission” means the transmission of television signals which can be reproduced in gradations of a single color only.
11. *Negative transmission.*—The term “negative transmission” means that a decrease in initial light intensity causes an increase in the transmitted power.
12. *Positive transmission.*—The term “positive transmission” means that an increase in initial light intensity causes an increase in the transmitted power.
13. *Progressive scanning.*—The term “progressive scanning” means a scanning process in which scanning lines trace one dimension substantially parallel to a side of the frame and in which successively traced lines are adjacent.
14. *Scanning.*—The term “scanning” means the process of analyzing successively, according to a predetermined method, the light values of picture elements constituting the total picture area.
15. *Scanning line.*—The term “scanning line” means a single continuous narrow strip containing highlights, shadows, and half-tones which is determined by the process of scanning.
16. *Synchronization.*—The term “synchronization” means the maintaining of one operation in step with another.
17. *Vestigial side band transmission.*—The term “vestigial side band transmission” means a system of transmission wherein one of the generated side bands is partially attenuated at the transmitter and radiated only in part. (See Appendix II).
18. *Visual frequency.*—The term “visual frequency” means the frequency of the signal resulting from television scanning.
19. *Visual transmitter power.*—The term “visual transmitter power” means the peak power output when transmitting a standard television signal.
20. *Peak power.*—The term “peak power” means the power over a radio frequency cycle corresponding in amplitude to synchronizing peaks.

C. Aural Transmitter

1. *Aural transmitter.*—The term “aural transmitter” means the radio equipment for the transmission of the aural signal only.
2. *Center frequency.*—The term “center frequency” means:
 - (1) The average frequency of the omitted wave when modulated by a sinusoidal signal.
 - (2) The frequency of the omitted wave without modulation.
3. *Frequency modulation.*—The term “frequency modulation” means

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Broadcast—Allocation & Field Service

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a system of modulation where the instantaneous radio frequency varies in proportion to the instantaneous *amplitude* of the modulating signals (amplitude of modulating signal to be measured after pre-emphasis, if used) and the instantaneous radio frequency is independent of the *frequency* of the modulating signal.

4. *Frequency swing*.—The term "frequency swing" means the instantaneous departure of the frequency of the omitted wave from the center frequency resulting from modulation.
5. *Percentage modulation*.—The term "percentage modulation" as applied to frequency modulation means the ratio of the actual frequency swing to the frequency swing defined as 100 percent modulation, expressed in percentage. For the aural transmitter of television broadcast stations, a frequency swing of ± 25 kilocycles is defined as 100 percent modulation.

2. Transmission Standards and Changes or Modifications Thereof

A. Transmission Standards

1. The width of the television broadcast channel shall be six megacycles per second.
2. The visual carrier shall be located 4.5 megacycles lower in frequency than the aural center frequency.
3. The aural center frequency shall be located 0.25 megacycles lower than the upper frequency limit of the channel.
4. The visual transmission amplitude characteristic shall be as shown in Appendix II.
5. The number of scanning lines per frame period shall be 525, interlaced two to one.
6. The frame frequency shall be 30 per second and the field frequency shall be 60 per second.
7. The aspect ratio of the transmitted television picture shall be 4 units horizontally to 3 units vertically.
8. During active scanning intervals, the scene shall be scanned from left to right horizontally and from top to bottom vertically, at uniform velocities.
9. A carrier shall be modulated within a single television channel for both picture and synchronizing signals, the two signals comprising different modulation ranges in amplitude (See Appendices I and II).
10. A decrease in initial light intensity shall cause an increase in radiated power (negative transmission).
11. The black level shall be represented by a definite carrier level, independent of light and shade in the picture.
12. The pedestal level (normal black level) shall be transmitted at 75 per cent (with a tolerance of plus or minus 2.5 per cent) of the peak carrier amplitude.
13. The maximum white level shall be 15 per cent or less of the peak carrier amplitude.
14. The signals radiated shall have horizontal polarization.
15. A radiated power of the aural transmitter not less than 50% or more than 150% of the peak radiated power of the video transmitter shall be employed.
- 16.* *Variation of Output*.—The peak-to-peak variation of transmitter output within one frame of video signal due to all causes, including hum, noise, and low-frequency response, measured at both synchronizing peak and pedestal level, shall not exceed 5% of the average synchronizing peak signal amplitude.
- 17.* *Black Level*.—The black level should be made as nearly equal to the pedestal level as the state of the art will permit. If they are made essentially equal, satisfactory operation will result and improved techniques will later lead to the establishment of the tolerance if necessary.
- 18.* *Brightness Characteristics*.—The transmitter output shall vary in substantially inverse logarithmic relation to the brightness of the subject. No tolerances are set at this time.

B. Change or Modification of Transmission Standards

The Commission will consider the question whether a proposed change or modification of transmission standards adopted for television would be in the public interest, convenience and necessity, upon petition being filed by the person proposing such change, or modification, setting forth the following:

- (1) The exact character of the change or modification proposed;
- (2) The effect of the proposed change or modification upon all other transmission standards that have been adopted by the Commission for television broadcast stations;
- (3) The experimentation and field tests that have been made to show that the proposed change or modification accomplishes an improvement and is technically feasible;
- (4) The effect of the proposed change or modification in the adopted standards upon operation and obsolescence of receivers;
- (5) The change in equipment required in existing television broadcast

stations for incorporating the proposed change or modification in the adopted standards, and

- (6) The facts and reasons upon which the petitioner bases his conclusion that the proposed change or modification would be in the public interest, convenience and necessity.

Should a change or modification in the transmission standards be adopted by the Commission, the effective date thereof will be determined in the light of the considerations mentioned in sub-paragraph (4) above.

3. Engineering Standards of Allocation

- A. Sections 3.603 through 3.606 of the Commission's Rules prescribes the basis of assignment of television broadcast facilities. Section 3.601 indicates the groups of channels that are available for assignment to television broadcast stations. As indicated by these rules, the number of channels are limited and therefore have been allocated in advance to specific areas. This listing has been carefully planned with a view to providing the greatest service to a maximum number of people and in general no departure from this plan will be made. However, where it can be shown that the public interest will be benefited by an alteration or rearrangement in this listing, the Commission will consider such adjustments as are necessary.
- B. The extent of service is determined by the point at which the ground wave is no longer of sufficient intensity to provide satisfactory broadcast service. The field intensity considered necessary for service is as follows:

TABLE I

Area	Medial Field Intensity
City, business or factory areas	5000 uv/m
Residential and Rural areas	500 uv/m

These figures are based upon the usual noise levels encountered in the two areas and upon the absence of interference from other television broadcast stations. The Commission will require that the transmitting antenna be so located as to provide a coverage area which is contiguous with the population density of the cities or metropolitan area with which the station is associated. The field intensity indicated above for computing coverage is the visual transmitter operating peak power.

- C. The service area is predicted as follows:

Profile graphs must be drawn for at least eight radials from the proposed antenna site. These profiles should be prepared for each radial beginning at the antenna site and extending to ten miles therefrom. Normally the radials are drawn for each 45° of azimuth; however, where feasible the radials should be drawn for angles along which roads tend to follow: (The latter method may be helpful in obtaining topographical data where otherwise unavailable, and is particularly useful in connection with mobile field intensity measurements of the station and the correlation of such measurements with predicted field intensities). In each case one or more radials must include the principal city or cities to be served, particularly in cases of rugged terrain, even though the city may be more than 10 miles from the antenna site. The profile graph for each radial should be plotted by contour intervals of from 40 to 100 feet and, where the data permit, at least 50 points of elevation (generally uniformly spaced) should be used for each radial. In instances of very rugged terrain where the use of contour intervals of 100 feet would result in several points in a short distance, 200 or 400 foot contour intervals may be used for such distances. On the other hand, where the terrain is uniform or gently sloping the smallest contour interval indicated on the topographic map (see below) should be used, although only a relatively few points may be available. The profile graph should accurately indicate the topography for each radial, and the graphs should be plotted with the distance in miles as the abscissa and the elevation in feet above mean sea level as the ordinate. The profile graphs should indicate the source of the topographical data employed. The graph should also show the elevation of the center of the radiating system. The graph may be plotted either on rectangular coordinate paper or on special paper which shows the curvature of the earth. It is not necessary to take the curvature of the earth into consideration in this procedure, as this factor is taken care of in the charts showing signal intensities. (Appendix IV). The average elevation of the eight mile distance between two and ten miles from the antenna site should then be determined from the profile graph for each radial. This may be obtained by averaging a large number of equally spaced points, by using a planimeter, or by obtaining the median elevation (that exceeded for 50% of the distance) in sectors and averaging those values. To determine the distance to a particular contour concerning the range of television broadcast stations, Appendix IV should be used. These charts have been prepared for frequencies in the center of the various portions of the television band and are to be used as follows: Figure 1 for Channel 1; Figure 2 for Channels 2 through 4; Figure 3 for Channels 5 and 6; and Figure 4 for Channels 7 through 13. The distance to a contour is determined by the effective radiated

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* These items are subject to change but are considered the best practice under the present state of the art. They will not be enforced pending a further determination thereof.

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power and the antenna height. The height of the antenna used in connection with Appendix IV should be the height of the center of the proposed antenna radiator above the average elevation obtained by the preceding method. The distances shown by Appendix IV are based upon an effective radiated power of one kilowatt; to use the charts for other powers the sliding scale associated with the charts should be trimmed and used as the ordinate scale. This sliding scale is placed on the charts with the appropriate gradation for power in line with the lower line of the top edge of the charts. The right edge of the scale is placed in line with the appropriate antenna height graduations and the charts then become direct reading for this power and antenna height. Where the antenna height is not one of those for which a scale is provided, the signal strength or distance is determined by interpolation between the curves connecting the equidistant points.

The foregoing process of determining the extent of the required contours shall be followed in determining the boundary of the proposed service area. The areas within the 5000 uv/m and 500 uv/m contours must be determined and submitted with each application for television broadcast stations. Each application shall include a map showing these contours, and for this purpose Sectional Aeronautical charts or other maps having a convenient scale may be used. The map shall show the radials along which the profile charts and expected field strength have been determined. The area within each contour should then be measured (by planimeter or other approximate means) to determine the number of square miles therein. In computing the area within the contours, exclude (1) areas beyond the borders of the United States, and (2) large bodies of water, such as ocean areas, gulfs, sounds, bays, large lakes, etc., but not rivers. Where interference is involved such areas shall be determined as indicated by Section V.

In cases where the terrain in one or more directions from the antenna site departs widely from the average elevation of the two to ten mile sector, the application of this prediction method may indicate contour distances that are different from those which may be expected in practice. In such cases the prediction method should be followed, but a showing may be made if desired concerning the distance to the contour as determined by other means. Such showing should include data concerning the procedure employed and sample calculations. For example, a mountain ridge may indicate the practical limit of service although the prediction method may indicate the contour elsewhere. In cases of such limitation, the map of predicted coverage should show both the regular predicted area and the areas as limited or extended by terrain. Both areas should be measured, as previously described; the area obtained by the regular prediction method should be given in the application form, with a supplementary note giving the limited or extended area. In special cases the Commission may require additional information as to the terrain in the proposed service area.

In determining the population served by television broadcast stations, it is considered that the built-up city areas and business districts in cities having over 10,000 population and located beyond the 5000 uv/m contour do not receive adequate service. Minor Civil Division maps (1940 Census) should be used in making population counts, excluding cities not receiving adequate service. Where a contour divides a minor division, uniform distribution of population within the division should be assumed in order to determine the population included within the contour, unless a more accurate count is available.

4. Topographical Data

In the preparation of the profile graphs previously described, the elevations or contour intervals shall be taken from the U. S. Geological Topographical Quadrangle Sheets for all areas for which such maps are available. If such maps are not published for the area in question, the next best topographic information should be used. Topographic data may sometimes be obtained from state and municipal agencies. The data from the Sectional Aeronautical Charts (including bench marks), or railroad depot elevations and highway elevations from road maps, may be used where no better information is available. In cases where limited topographic data can be obtained, use may be made of an altimeter in a car driven along roads extending generally radially from the transmitter site.

The Commission will not ordinarily require the submission of topographical maps for areas beyond 15 miles from the antenna sites, but the maps must include the principal city or cities to be served. If it appears necessary, additional data may be requested.

The U. S. Geological Survey Topography Quadrangle Sheets may be obtained from the U. S. Geological Survey, Department of the Interior, Washington, D. C., for ten cents each. The Sectional Aeronautical Charts are available from the U. S. Coast and Geodetic Survey, Department of Commerce, Washington, D. C., for twenty-five cents each. Other sources of topographic maps or data will be furnished at a later date.

5. Interference Standards

Field intensity measurements are preferable in predicting interference between television broadcast stations and should be used, when available, in determining the extent of interference. (For methods and procedure, see Section 6). In lieu of measurements, the interference should be predicted in accordance with the method described herein.

Objectionable visual interference is considered to exist when the interfering signal exceeds that given by the ratios of Table II. In Table II the desired signal is median field and the undesired signal is the tropospheric signal intensity exceeded for 10% of the time.

TABLE II

Channel Separation	Ratio of Desired to Undesired Signals
Same channel	100:1
Adjacent channel	2:1

It is considered that stations on alternate channels or on channels separated by 4 Mc can be operated in the same city or area without objectionable interference, (i. e., on this basis, channels 1 and 2 or 4 and 5 could be used in the same city or area).

As an example of the data contained in Table II, objectionable interference from a co-channel station is considered to exist at the 500 uv/m contour of a station if a tropospheric signal from the co-channel station equals or exceeds 5 uv/m for at least ten percent of the time. The ten per cent values for one kilowatt of power and various antenna heights are given in Appendix V*, and values for other powers may be obtained by using the sliding scale as for Appendix IV. The values indicated by Appendix V are based upon available data, and are subject to change as additional information concerning tropospheric wave propagation is obtained.

At the present time it is considered sufficient to consider only the ground wave field intensities in determining the extent of adjacent channel interference.

In determining the points at which the interference ratio is equal to the values shown in Table II, the field intensities for the two interfering signals under consideration should be computed for a considerable number of points along the line between the two stations. Using this data, field intensity versus distance curves should be plotted (e. g., cross-curves on graph paper) in order to determine the points on this path where the interference ratios exist. The points established by this method, together with the points along the contours where the same ratios are determined, are considered to be generally sufficient to predict the area of interference. Additional points may be required in case of irregular terrain or directional antenna systems.

The area of interference, if any, shall be shown in connection with the map of predicted coverage required by the application form, together with the basic data employed in computing such interference. The map shall show the interference within the 500 uv/m contour.

6. Field Intensity Measurements in Allocation

When field intensity measurements are required by the Commission's rules or when employed in determining the extent of service or interference of existing stations, such measurements should be made in accordance with the procedure outlined herein.

Measurements made to determine the service and interference areas of television broadcast stations should be made with mobile equipment along roads which are as close and similar as possible to the radials showing topography which were submitted with the application for construction permit. Suitable measuring equipment and a continuous recording device must be employed, the chart of which is either directly driven from the speedometer of the automobile in which the equipment is mounted or so arranged that distances and identifying landmarks may be readily noted. The measuring equipment must be calibrated against recognized standards of field intensity and so constructed that it will maintain an acceptable accuracy of measurement while in motion or when stationary. The equipment should be so operated that the recorder chart can be calibrated directly in field intensity in order to facilitate analysis of the chart. The receiving antenna must be nondirectional and horizontally polarized.

Mobile measurements should be made with a minimum chart speed of 3 inches per mile and preferably 5 or 6 inches per mile. Locations shall be noted on the recorder chart as frequently as necessary to definitely fix the relation between the measured field intensity and the location. The time constant of the equipment should be such as to permit adequate analysis of the charts, and the time constant employed shall be shown. Measurements should be made to a point on each radial well beyond the particular contour under investigation.

While making field intensity measurements the visual transmitter shall be used. It is recommended that a black picture be transmitted or that the transmitter be operated at black level without synchronization peaks. Operation at a power somewhat less than black level is permissible, but too great a reduction in power is not recommended due to the difficulty of recording weak signals. In any event, an appropriate factor shall be used to convert the readings obtained to the field strength that would exist in synchronization peaks while operating at the authorized power. If other means of measurements are to be used a request should be made to the Commission stating the reasons therefor and the means to be used.

After the measurements are completed, the recorder chart shall be divided into not less than 15 sections on each equivalent radial from

* Charts for Appendix V will be available at some future date when sufficient measurements of tropospheric signals are available. Until such time as these charts are available, interference should be predicted on the basis of ground wave charts (Appendix IV).

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the station. The field intensity in each section of the chart shall be analyzed to determine the field intensity received 50 per cent of the distance (median field) throughout the section, and this median field intensity associated with the corresponding sector of the radial. The field intensity figures must be corrected for a receiving antenna elevation of thirty feet and for any directional effects of the automobile not otherwise compensated. This data should be plotted for each radial, using log-log coordinate paper with distance as the abscissa and field intensity as the ordinate. A smooth curve should be drawn through these points (of median fields for all sectors), and this curve used to determine the distance to the desired contour. The distances obtained for each radial may then be plotted on the map of predicted coverage or on polar coordinate paper (excluding water areas, etc.) to determine the service and interference areas of a station.

In making measurements to establish the field intensity contours of a station mobile recordings should be made along each of the radials drawn in Section 3C above. Measurements should extend from the vicinity of the station out to the 500 uv/m measured contour and somewhat beyond. These measurements would be made for the purpose of determining the variation of the measured contours from those predicted. Adjustment of power or antenna may be required to fit the actual contours to that predicted.

In predicting tropospheric interference on the basis of the above measurements, such measurements shall be carried out in the manner indicated above to determine the 500 uv/m contour. Using the appropriate figure in Appendix IV for the channel involved and the sliding scale, the equivalent radiated power shall be determined by placing the sliding scale on the chart (using the appropriate antenna height) and moving the scale until the distance to the 500 uv/m contour (as determined above) and the 500 uv/m mark are opposite. The equivalent radiated power is then read from the sliding scale where it crosses the lower line of the top edge of the chart. Changing to the corresponding figure in Appendix V and using the equivalent radiated power just determined, the distance to the interfering contour under investigation is read in the usual manner.

In certain cases the Commission may desire more information or recordings and in these instances special instructions will be issued. This may include fixed location measurements to determine tropospheric propagation and fading ratios.

Complete data taken in conjunction with field intensity measurements shall be submitted to the Commission in affidavit form, including the following:

- A. Map or maps showing the roads or points where measurements were made, the service and/or interference areas determined by the prediction method and by the measurements, and any unusual terrain characteristics existing in these areas. (This map may preferably be of a type showing topography in the area). The 5000 and 500 uv/m contours shall be shown.
- B. If a directional transmitting antenna is employed, a diagram or polar coordinate paper showing the predicted free space field intensity in millivolts per meter at one mile in all directions. (See Section 8).
- C. A full description of the procedures and methods employed including the type of equipment, the method of installation and operation, and calibration procedures.
- D. Complete data obtained during the survey, including calibration.
- E. Antenna system and power employed during the survey.
- F. Name, address, and qualifications of the engineer or engineers making the measurements.

All data shall be submitted to the Commission in triplicate, except that only the original or one photostatic copy need be submitted of the actual recording tapes.

7. Transmitter Location

- A. The transmitter location should be as near the center of the proposed service area as possible consistent with the applicant's ability to find a site with sufficient elevation to provide service throughout the area. Location of the antenna at a point of high elevation is necessary to reduce to a minimum the shadow effect on propagation due to hills and buildings which may reduce materially the intensity of the station's signals in a particular direction. The transmitting site should be selected consistent with the purpose of the station, i.e., whether it is intended to serve a small city, a metropolitan area or a large area. Inasmuch as service may be provided by signals of 5000 uv/m or greater field intensities in metropolitan areas, and inasmuch as signals below 500 uv/m may provide service in rural areas, considerable latitude in the geographical location of the transmitter is permitted; however, the necessity for a high elevation for the antenna may render this problem difficult. In general, the transmitting antenna of a station should be located at the most central point at the highest elevation available. In providing the best degree of service to an area, it is usually preferable to use a high antenna rather than a lower antenna with increased transmitter power. The location should be so chosen that line-of-sight can be obtained from the antenna over the principal city or cities to be served; in no event should there be a major obstruction in this path.
- B. The transmitting location should be selected so that the 5000 uv/m

contour encompasses the urban population within the area to be served and the 500 uv/m or the interference free contour coincides generally with the limits of the area to be served. It is recognized that topography, shape of the desired service area, and population distribution may make the choice of a transmitter location difficult. In such cases consideration may be given to the use of a directional antenna system, although it is generally preferable to choose a site where a non-directional antenna may be employed.

- C. In cases of questionable antenna locations it is desirable to conduct propagation tests to indicate the field intensity expected in the principal city or cities to be served and in other areas, particularly where severe shadow problems may be expected. In considering applications proposing the use of such locations, the Commission may require site tests to be made. Such tests should be made in accordance with the measurement procedure previously described, and full data thereon must be supplied to the Commission. Test transmitters should employ an antenna having a height as close as possible to the proposed antenna height, using a balloon or other support if necessary and feasible. Information concerning the authorization of site tests may be obtained from the Commission upon request.
- D. Present information is not sufficiently complete to establish "blanket areas" of television broadcast stations. A "blanket area" is that area adjacent to a transmitter in which the reception of other stations is subject to interference due to the strong signal from this station. Where it is found necessary to locate the transmitter in a residential area where blanketing problems may appear to be excessive the application must include a showing concerning the availability of other sites. The authorization of station construction in areas where blanketing problems appear to be excessive will be on the basis that the applicant will assume full responsibility for the adjustment of reasonable complaints arising from excessively strong signals of the applicant's station.

Cognizance must of course be taken regarding the possible hazard of the proposed antenna structure to aviation and the proximity of the proposed site to airports and airways. In passing on proposed construction, the Commission refers each case to the Civil Aeronautics Administration for its recommendations. Antenna painting and/or lighting may be required at the time of construction or at a later date.

8. Antenna Systems

- A. An antenna which is high in respect to the average level of the territory it serves is desirable in order to reduce the effect of shadows. The antenna must be constructed so that it is as clear as possible of surrounding buildings or objects that would cause shadow problems.
- B. Applications proposing the use of directional antenna systems must be accompanied by the following:
 - (1) Complete description of the proposed antenna system.
 - (2) Orientation of array with respect to true north; time phasing of fields from elements (degrees leading or lagging); space phasing of elements (in feet and degrees); and ratio of fields from elements.
 - (3) Calculated field intensity pattern (on letter-size polar coordinate paper) giving the free space field intensity in millivolts per meter at one mile in the horizontal plane, together with the formula used, constants employed, sample calculations, and tabulations of calculation data.
 - (4) Name, address, and qualifications of the engineer making the calculations.
- C. Applications proposing (1) the use of television broadcast antennas in the immediate vicinity (i.e., 200 feet or less) of television broadcast, antennas operating on a channel within 20% in frequency of the proposed channel, or (2) the use of television antennas on channels 5 or 6 in the immediate vicinity of FM broadcast antennas, must include a showing as to the expected effect if any, of such proximity operation.
- D. In cases where it is proposed to use a tower of a standard broadcast station as a supporting structure for a television broadcast antenna, an application for construction permit (or modification of construction permit) for such station must be filed for consideration with the television application. An application may be required for other classes of stations when the tower is to be used in connection with a television station. When a television antenna is mounted on a non-directional standard broadcast antenna, new resistance measurements must be made of the standard broadcast antenna after installation and testing of the television antenna. During the installation and until the new resistance determination is approved, the standard broadcast station licensee should apply for authority (informal application) to operate by the indirect method of power determination. The television license application will not be considered until the application form concerning resistance measurements is filed for the standard broadcast station. When a television antenna is mounted on an element of a standard broadcast directional antenna, a full engineering study concerning the effect of the television antenna on the directional pattern must be filed with the application concerning the standard broadcast station. De-

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pending upon the individual case, the Commission may require readjustment and certain field intensity measurements of the standard broadcast station following the completion of the television antenna system.

When the proposed television antenna is to be mounted on a tower in the vicinity of a standard broadcast directional array and it appears that the operation of the directional antenna system may be affected, an engineering study must be filed with the television application concerning the effect of the television antenna on the directional pattern. Readjustment and field intensity measurements of the standard broadcast station may be required following construction of the television antenna.

Information regarding data required in connection with standard broadcast directional antenna systems may be found in the Standards of Good Engineering Practice Concerning Standard Broadcast Stations.

E. In the event a common tower is used by two or more licensees for antenna and/or antenna supporting purposes, the licensee who is owner of the tower shall assume full responsibility for the installation and maintenance of any painting and/or lighting requirements.

In the event of shared ownership, one licensee shall assume such responsibility and advise the Commission accordingly.

F. Standard Lamps and Paints.

When necessary for the protection of air navigation, the antenna and supporting structure shall be painted and illuminated in accordance with the specifications supplied by the Commission pursuant to Section 303 (q) of the Communications Act of 1934, as amended.

These individual specifications are issued for and attached to each authorization for an installation. The details of the specifications depend on the degree of hazard presented by the particular installation. The tower paint shall be kept in good condition and repainted as often as necessary to maintain this condition.

General information regarding painting and lighting requirements is contained in the Obstruction Marking Manual available from the Civil Aeronautics Administration, Washington 25, D. C.

9. Transmitters and Associated Equipment

A. Visual transmitter design.

The general design of television broadcast visual transmitting equip-

ment shall be in accordance with the following principles and specifications:

(1) The overall attenuation characteristics of the transmitter measured in the antenna transmission line after the vestigial side band filters shall not be greater than

2 db at 0.5 Mc
2 db at 1.25 Mc
3 db at 2.0 Mc
6 db at 3.0 Mc
12 db at 3.5 Mc

below the ideal demodulated curve (See Appendix III). The curve shall be substantially smooth between these specified points exclusive of the region from 0.75 Mc to 1.25 Mc.¹

(2) The field strength or voltage of the lower side band as radiated or dissipated and measured as describe in (3) below shall not be greater than -20 db for a modulating frequency of 1.25 Mc or greater.¹

(3) The attenuation characteristics of a visual transmitter shall be measured by application of a modulating signal to the transmitter input terminals in place of the normal composite television video signal. The signal applied shall be a composite signal composed of a synchronizing signal to establish peak output voltage plus a variable frequency sine wave voltage occupying the interval between synchronizing pulses. The axis of the sine wave in the composite signal observed in the output monitor shall be maintained at an amplitude 0.5 of the voltage at synchronizing peaks. The amplitude of the sine wave input shall be held at a constant value. This constant value should be such that at no modulating frequency does the maximum excursion of the sine wave, observed in the composite output signal monitor, exceed the value 0.75 of peak output voltage. The amplitude of the 100 kilocycle sideband shall be measured and designated zero db as a basis for comparison. The modulation signal frequency shall then be varied over the desired range and the field strength or signal voltage of the corresponding sidebands measured.

As an alternate method of measuring, in those cases in which the automatic d-c insertion can be replaced by manual control, the above characteristic may be taken by the use of a video sweep

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generator and without the use of pedestal synchronizing pulses. The d-c level shall be set for mid-characteristic operation.¹

- (4) The radio frequency signal, as radiated, shall have an envelope as would be produced by a modulating signal in conformity with Appendix I, as modified by vestigial operation specified by Appendix II.
- (5) The time interval between the leading edges of successive horizontal pulses shall vary less than one half of one per cent of the average interval.
- (6) The rate of change of the frequency of recurrence of the leading edges of the horizontal synchronizing signals shall be not greater than 0.15 per cent per second, the frequency to be determined by an averaging process carried out over a period of not less than 20, nor more than 100 lines, such lines not to include any portion of the vertical blanking signal.

B. Aural transmitter design

The general design of the aural transmitting equipment associated with a television station shall be in accordance with the following principles and specifications:

- (1) The transmitter shall operate satisfactorily with a frequency swing of ± 25 kilocycles, which is considered 100% modulation. It is recommended, however, that the transmitter be designed to operate satisfactorily with a frequency swing of at least ± 40 kilocycles.
- (2) The transmitting system (from input terminals of microphone pre-amplifier, through audio facilities at the studio, through telephone lines or other circuits between studio and transmitter, through audio facilities at the transmitter, and through the transmitter, but excluding equalizers for the correction of deficiencies in microphone response) shall be capable of transmitting a band of frequencies from 50 to 15,000 cycles. Pre-emphasis shall be employed in accordance with the impedance-frequency characteristic of a series inductance-resistance network having a time constant of 75 microseconds (See Appendix VI). The deviation of the system response from the standard pre-emphasis curve shall lie between two limits as shown by Appendix VI. The upper of these limits shall be uniform (no deviation) from 50 to 15,000 cycles. The lower limit shall be uniform from 100 to 7500 cycles, and three db below the upper limit; from 100 to 50 cycles the lower limit shall fall from three db limit at a uniform rate of one db per octave (four db at 50 cycles); from 7500 to 15,000 cycles the lower limit shall fall from the three db limit at a uniform rate of two db per octave (five db at 15,000 cycles).
- (3) At any modulating frequency between 50 and 15,000 cycles and at modulation percentage of 25%, 50% and 100%, the combined audio frequency harmonics measured in the output of the system shall not exceed the root-mean-square values given in the following table:

Modulating frequency	Distortion
50 to 100 cycles	3.5%
100 to 7500 cycles	2.5%
7500 to 15000 cycles	3.0%

Measurements shall be made employing 75 microsecond de-emphasis in the measuring equipment and 75 microsecond pre-emphasis in the transmitting equipment, and without compression if a compression amplifier is employed. Harmonics shall be included to 30 kc.*

It is recommended that none of the three main divisions of the system (transmitter, studio to transmitter circuit, and audio facilities) contribute over one-half of these percentages, since at some frequencies the total distortion may become the arithmetic sum of the distortions of the divisions.

- (4) The transmitting system output noise level (frequency modulation) in the band of 50 to 15,000 cycles shall be at least 55 db below the audio frequency level representing a frequency swing of ± 25 kc.**
- (5) The transmitting system output noise level (amplitude modulation) in the band of 50 to 15,000 cycles shall be at least 50 db below the level representing 100% amplitude modulation.**

¹ In the case of (1) above, output measurement shall be made with the transmitter operating into a dummy load of pure resistance and the demodulated voltage measured across this load. The ideal demodulated curve is that shown in Appendix III.

In the case of (2) above, field strength measurements are desired. It is anticipated that these may not yield data which are consistent enough to prove compliance with the attenuation standards prescribed above. In that case, measurements with a dummy load of pure resistance together with data on the antenna characteristics shall be taken in place of overall field measurements. The 'synchronizing signal' referred to in those paragraphs means either a standard synchronizing wave form or any pulse that will properly set the peak.

* Measurements of distortion using de-emphasis in the measuring equipment are not practical at the present time for the range 7500 to 15000 cycles for 25 and 50 percent modulation. Therefore, measurements should be made at 100% modulation and on at least the following modulating frequencies: 50, 100, 400, 1,000, 5,000, 10,000, and 15,000 cycles. At 25 and 50% modulation measurements should be made on at least the following modulating frequencies: 50, 100, 400, 1,000 and 5,000 cycles.

** For the purpose of these measurements the visual transmitter should be inoperative since the exact amount of noise permissible from that source is not known at this time.

- (6) If a limiting or compression amplifier is employed, precaution should be maintained in its connection in the circuit due to the use of pre-emphasis in the transmitting system.

C. Design applicable to both visual and aural transmitters

In addition to design features applicable to the individual transmitters, the general design of television broadcast (visual and aural) transmitting equipment shall be in accordance with the following principles and specifications:

- (1) Automatic means shall be provided in the transmitters to maintain the authorized carrier frequencies within the allowable tolerance ($\pm 0.002\%$).
- (2) The transmitters shall be equipped with suitable indicating instruments for the determination of operating power and with other instruments as are necessary for proper adjustment, operation, and maintenance of the equipment.
- (3) Adequate provision shall be made for varying the output power of the transmitters to compensate for excessive variations in line voltage or for other factors affecting the output powers.
- (4) Adequate provisions shall be provided in all component parts to avoid overheating at the rated maximum output powers.
- (5) Means should be provided for connection and continuous operation of approved frequency and modulation monitors.

D. Construction

In general, the transmitters shall be constructed either on racks and panels or in totally enclosed frames protected as required by article 810 of the National Electrical Code² and as set forth below:

- (1) Means shall be provided for making all tuning adjustments, requiring voltages in excess of 350 volts to be applied to the circuit, from the front of the panels with all access doors closed.
- (2) Proper bleeder resistors or other automatic means shall be installed across all the capacitor banks to lower any voltage which may remain accessible with access door open to less than 350 volts within two seconds after the access door is opened.
- (3) All plate supply and other high voltage equipment, including transformers, filters, rectifiers and motor generators, shall be protected so as to prevent injury to operating personnel.
 - (a) Commutator guards shall be provided on all high voltage rotating machinery. Coupling guards should be provided on motor generators.
 - (b) Power equipment and control panels of the transmitters shall meet the above requirements (exposed 220 volt AC switching equipment on the front of the power control panels is not recommended but is not prohibited).
 - (c) Power equipment located at a television broadcast station not directly associated with the transmitters (not purchased as part of same), such as power distribution panels, are not under the jurisdiction of the Commission; therefore Section 3.654 does not apply.
- (4) Metering equipment
 - (a) All instruments having more than 1,000 volts potential to ground on the movement shall be protected by a cage or cover in addition to the regular case. (Some instruments are designed by the manufacturers to operate safely with voltages in excess of 1,000 volts on the movement. If it can be shown by the manufacturer's rating that the instrument will operate safely at the applied potential, additional protection is not necessary.)
 - (b) In case the plate voltmeters are located on the low potential side of the multiplier resistors with the potential of the high potential terminal of the instruments at or less than 1,000 volts above ground, no protective case is required. However, it is good practice to protect voltmeters subject to more than 5,000 volts with suitable over-voltage protective devices across the instrument terminals in case the winding opens.
 - (c) Transmission line meters and any other radio frequency instrument which may be necessary for the operator to read shall be so installed as to be easily and accurately read without the operator having to risk contact with circuits carrying high potential radio frequency energy.
 - (d) It is recommended that component parts comply as much as possible with the component specifications designated by the Army-Navy Electronics Standards Agency.

E. Wiring and Shielding

- (1) The transmitter panels or units shall be wired in accordance

² The pertinent sections of article 810 of the National Electrical Code reads as follows: "8191. General.—Transmitters shall comply with the following:

"a. Enclosing.—The transmitter shall be enclosed in a metal frame or grille, or separated from the operating space by a barrier or other equivalent means, all metallic parts of which are effectually connected to ground.

"b. Grounding of controls.—All external metallic handles and controls accessible to the operating personnel shall be effectually grounded. No circuit in excess of 150 volts shall have any parts exposed to direct contact. A complete dead-front type of switchboard is preferred.

"c. Interlocks on doors.—All access doors shall be provided with interlocks which will disconnect all voltages in excess of 350 volts when any access door is opened."

with standard practice, such as insulated leads properly cabled and supported, concentric lines or rigid bus bar properly insulated and protected.

- (2) Wiring between units of the transmitters, with the exception of circuits carrying radio frequency energy or video energy, shall be installed in conduits or approved fiber or metal raceways to protect it from mechanical injury.
- (3) Circuits carrying radio frequency or video energy between units shall be either coaxial, two wire balanced lines, or properly shielded.
- (4) All stages or units shall be adequately shielded and filtered to prevent interaction and radiation.
- (5) The frequency and modulation monitors and associated radio frequency lines to the transmitter shall be thoroughly shielded.

F. Installation

- (1) The installation shall be made in suitable quarters.
- (2) Since an operator must be on duty during operation, suitable facilities for his welfare and comfort shall be provided.

G. Spare tubes

A spare tube of every type employed in the transmitters and frequency modulation monitors shall be kept on hand at the equipment location. When more than one tube of any type are employed, the following table determines the number of spares of that type required:

Number of each type employed:	Spares required
1 or 2	1
3 to 5	2
6 to 8	3
9 or more	4

An accurate circuit diagram and list of required spare tubes, as furnished by the manufacturer of the equipment, shall be supplied and retained at the transmitter location.

H. Operation

In addition to specific requirements of the rules governing television broadcast stations, the following operating requirements are specified:

- (1) Spurious emissions, including radio frequency harmonics, shall be maintained at as low a level as the state of the art permits.
- (2) If a limiting or compression amplifier is used in conjunction with the aural transmitter, due operating precautions should be maintained in its use due to pre-emphasis in the transmitting system.

I. Studio Equipment

Studio equipment shall be subject to all the above requirements where applicable except as follows:

- (1) If properly covered by an underwriters' certificate, it will be considered as satisfying safety requirements.
- (2) Section 8191 of Article 810 of the National Electrical Code shall apply for voltages only in excess of 50 volts.

No specific requirements are made relative to the design and acoustical treatment of studios. However, the design of studios, particularly the main studio, shall be compatible with the required performance characteristics of television broadcast stations.

10. Indicating Instruments

A. A television broadcast station shall be equipped with suitable indicating instruments of accepted accuracy to measure the direct plate voltage and current of the last radio stage of the visual and aural transmitter and an instrument for reading the transmission line of both transmitters.

The following requirements and specifications shall apply to indicating instruments used by television broadcast stations in compliance with this rule:

- (1) Length of scale shall be not less than 2 3/10 inches.
- (2) Accuracy shall be at least 2 per cent of the full scale reading.
- (3) Scale shall have at least 40 divisions.
- (4) Full scale reading shall be not greater than five times the minimum normal indication.

No specifications are prescribed at this time regarding the peak indicating device required by Section 11B(1) of these standards.

B. No instruments indicating the plate current or plate voltage of the last radio stage shall be changed or replaced without written authority of the Commission, except by instruments of the same maximum scale readings and accuracy. Requests for authority to use an instrument of different maximum scale reading and/or accuracy shall be made by letter or telegram giving the manufacturer's name, type number, and full scale reading of the proposed instrument and the values of current or voltage the instrument will be employed to indicate. Requests for temporary authority to operate without an instrument or with a substitute instrument may be made by letter or telegram stating the necessity therefor and the period involved.

C. No required instrument the accuracy of which is questionable shall be employed. Repairs and calibration of instruments shall be made by the manufacturer, or by an authorized instrument repair service of the manufacturer, or by some other properly qualified or equipped instrument repair service. In any case, the repaired instrument must be supplied with a certificate of calibration.

D. Recording instruments may be employed in addition to the indicating instruments to record the direct plate current and/or voltage to the last radio stage provided that they do not affect the operation of the circuits or accuracy of the indicating instruments. If the records are to be used in any proceeding before the Commission, as representative of operation, the accuracy must be the equivalent of the indicating instruments and the calibration shall be checked

at such intervals as to insure the retention of such accuracy.
E. The function of each instrument used in the equipment shall be clearly and permanently shown on the instrument itself or on the panel immediately adjacent thereto.

11. Operating Power—

Determination and Maintenance

A. Determination

(1) Visual transmitter

The average power shall be measured while operating into a dummy load of substantially zero reactance and a resistance equal to the transmission line surge impedance, while transmitting a standard black television picture. The peak power shall be the power obtained by this method, multiplied by the factor 1.68. During this measurement the direct plate voltage and current of the last radio stage and the peak output voltage or current shall be read for use below.

(2) Aural transmitter

The operating power of the aural transmitter shall be determined by the indirect method. This is the product of the plate voltage (E_p) and the plate current (I_p) of the last radio stage, and an efficiency factor, F ; that is:

$$\text{Operating power} = E_p \times I_p \times F$$

The efficiency factor, F , shall be established by the transmitter manufacturer for each type of transmitter for which he requests FCC approval, and shall be shown in the instruction books supplied to the customer with each transmitter. In the case of composite equipment the factor F shall be furnished to the Commission by the applicant along with a statement of the basis used in determining such factor.

B. Maintenance

(1) Visual Transmitter

The peak power shall be monitored by a peak reading device which reads proportionally to other voltage or current on the transmission line operating into the antenna, the meter to be calibrated during the measurement described in A(1) above. The operating power as so monitored shall be maintained as near as practicable to the authorized operating power and shall not exceed the limits of 10 percent above and 20 percent below the authorized power except in emergencies.

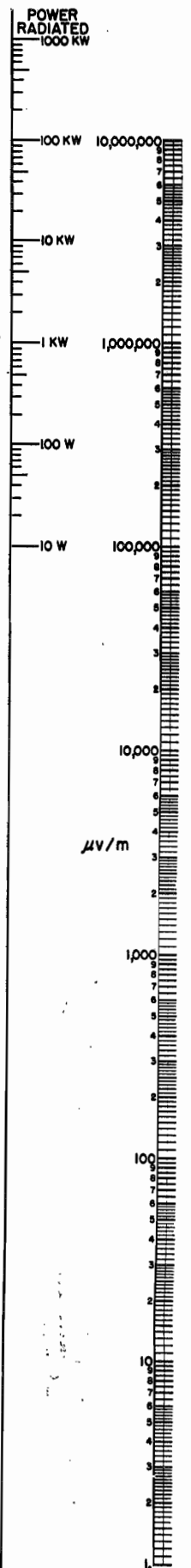
As a further check both plate voltage and plate current of the output stage shall be measured with a standard black television picture with the transmitter operating into the antenna. Those values must agree substantially with corresponding readings taken under A(1) above.

(2) Aural Transmitter

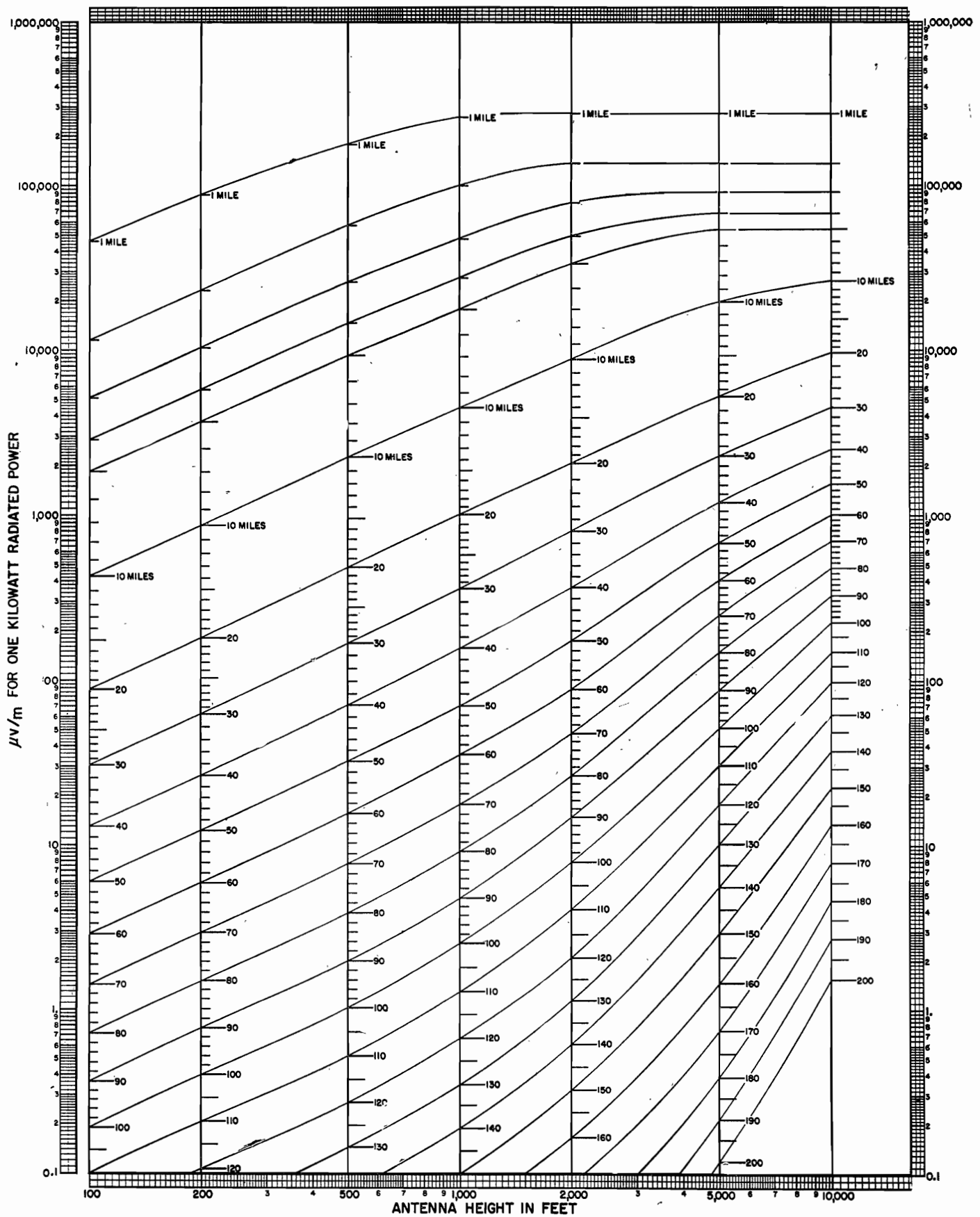
The operating power of aural transmitters shall be

(Continued on page 530)

(The scale at right to be used with charts on pages 530-533.)



APPENDIX IV



APPENDIX IV
FIGURE I

GROUND WAVE SIGNAL RANGE FOR TELEVISION

46 mc, $\sigma = 5 \times 10^{-14}$ s.m.u., $f = 15$, RECEIVING ANTENNA HEIGHT 30 FEET
FOR HORIZONTAL (AND APPROX. FOR VERTICAL) POLARIZATION

(Gauge on page 529 to be used in conjunction with this chart)

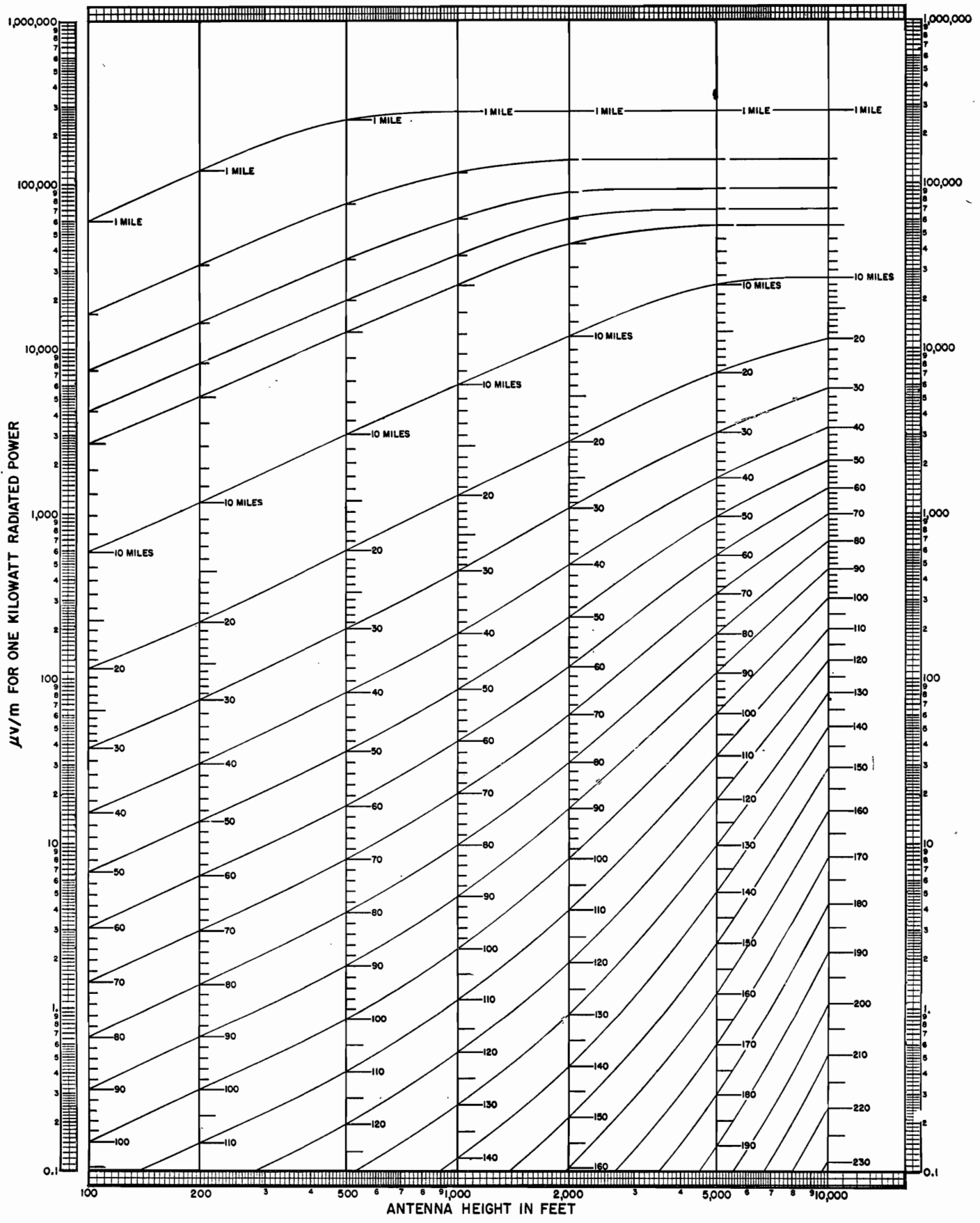
maintained as near as practicable to the authorized operating power, and shall not exceed the limits of 10 percent above and 20 percent below the authorized power except in emergencies.

(3) In the event it becomes impossible to operate with the authorized power, the station may be operated with reduced power for a period of 10 days or less provided the Commission and the Inspector in Charge of the district in which the station is located shall be notified in writing

immediately thereafter and also upon the resumption of the normal operating power.

12. Auxiliary Transmitters

Auxiliary transmitters may not exceed the power rating of the main transmitters. As a general guide specifications for auxiliary transmitters should conform as much as possible to those of the main transmitters. No requirements are set forth at this time.

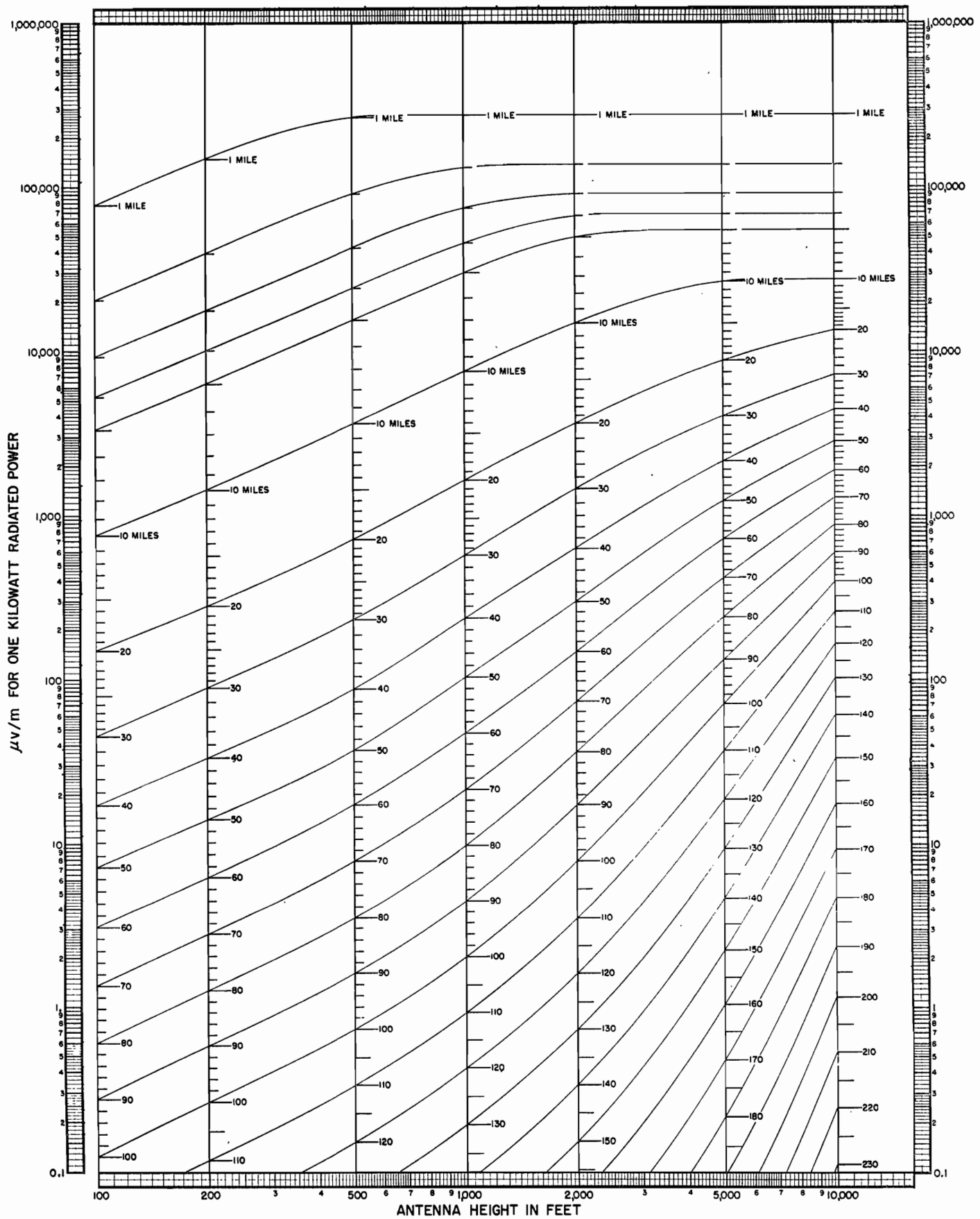


APPENDIX IV
FIGURE 2

GROUND WAVE SIGNAL RANGE FOR TELEVISION

63 mc, $\sigma = 5 \times 10^{-14}$ e.m.u., $f = 15$, RECEIVING ANTENNA HEIGHT 30 FEET
FOR HORIZONTAL (AND APPROX. FOR VERTICAL) POLARIZATION

(Note: Gauge on page 529 used in conjunction with this chart.)

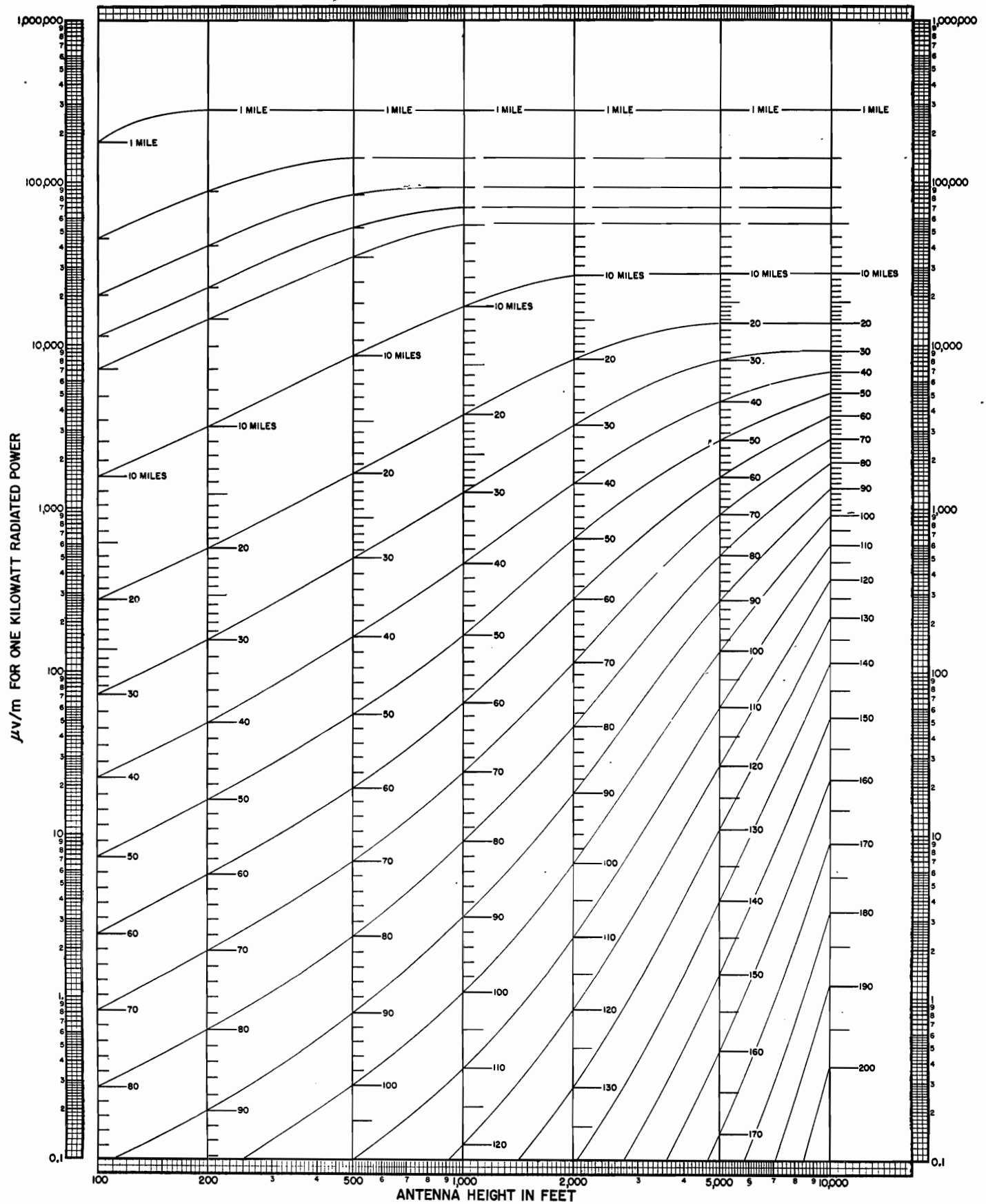


APPENDIX IV
FIGURE 3

GROUND WAVE SIGNAL RANGE FOR TELEVISION

82 mc, $\sigma = 5 \times 10^{-4}$ e.m.u., $f = 15$, RECEIVING ANTENNA HEIGHT 30 FEET
FOR HORIZONTAL (AND APPROX. FOR VERTICAL) POLARIZATION

(Note: Gauge on page 529 used in conjunction with this chart.)



APPENDIX IV
FIGURE 4

GROUND WAVE SIGNAL RANGE FOR TELEVISION

195 mc, $\sigma = 5 \times 10^{-14}$ e.m.u., $\epsilon = 15$, RECEIVING ANTENNA HEIGHT 30 FEET
FOR HORIZONTAL (AND APPROX. FOR VERTICAL) POLARIZATION

(Note: Gauge on page 529 used in conjunction with this chart.)

STANDARDS OF GOOD ENGINEERING PRACTICE FOR FM STATIONS

INTRODUCTION

There are presented herein the Commission's engineering standards relating to the allocation and operation of FM broadcast stations. These standards also apply to noncommercial educational (FM) broadcast stations, except as noted herein. The Commission's Rules and Regulations contain references to these standards, which have been approved by the Commission and thus are considered as reflecting its opinion in all matters involved.

The standards set forth herein are those deemed necessary for the construction and operation of FM broadcast stations to meet the requirements of technical regulations and for operation in the public interest along technical lines not otherwise enunciated. These standards are based upon the best engineering data available, including evidence at hearings conferences with radio engineers, and data supplied by manufacturers of radio equipment and by licensees of FM broadcast stations. These standards are complete in themselves and supersede previous engineering standards or policies of the Commission concerning FM broadcast stations. While these standards provide for flexibility and indicate the conditions under which they are applicable it is not expected that material deviation from the fundamental principles will be recognized unless full information is submitted as to the need and reasons therefor.

These standards will necessarily be revised from time to time as progress is made in the art. The Commission will accumulate and analyze engineering data available as to the progress of the art so that these standards may be kept current with technical developments.

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1. DEFINITIONS

A. *FM Broadcast station*—The term "FM broadcast station" means a station employing frequency modulation in the FM broadcast band and licensed primarily for the transmission of radiotelephone emissions intended to be received by the general public.

B. *Frequency modulation*—The term "frequency modulation" means a system of modulation where the instantaneous radio frequency varies in proportion to the instantaneous *amplitude* of the modulating signal (amplitude of modulating signal to be measured after pre-emphasis, if used) and the instantaneous radio frequency is independent of the *frequency* of the modulating signal.

C. *FM broadcast band*—The term "FM broadcast band" means the band of frequencies extending from 88 to 108 megacycles, which includes those assigned to noncommercial educational broadcasting.

D. *Center frequency*—The term "center frequency" means:

(1) The average frequency of the emitted wave when modulated by a sinusoidal signal.

(2) The frequency of the emitted wave without modulation.

E. *Frequency swing*—The term "frequency swing" means the instantaneous departure of the frequency of the emitted wave from the center frequency resulting from modulation.

F. *FM broadcast channel*—The term "FM broadcast channel" means a band of frequencies 200 kilocycles wide and is designated by its center frequency. Channels for FM broadcast stations begin at 88.1 megacycles and continue in successive steps of 200 kilocycles to and including 107.9 megacycles.

G. *Antenna field gain*—The term "antenna field gain" of an FM broadcast antenna means the ratio of the effective free space field intensity produced at one mile in the horizontal plane expressed in millivolts per meter for 1 kilowatt antenna input power to 137.6 mv/m.

H. *Free space field intensity*—The term "free space field intensity" means the field intensity that would exist at a point in the absence of waves reflected from the earth or other reflecting objects.

I. *Multiplex transmission*—The term "multiplex transmission" means the simultaneous transmission of two or more signals within a single channel. Multiplex transmission as applied to FM broadcast stations means the transmission of facsimile or other signals in addition to the regular broadcast signals.

J. *Percentage modulation*—The term "percentage modulation" as applied to frequency modulation means the ratio of the actual frequency swing to the frequency swing defined as 100 percent modulation, expressed in percentage. For FM broadcast stations, a frequency swing of ± 75 kilocycles is defined as 100 percent modulation.

K. *Effective Radiated Power*—The term "effective radiated power" means the product of the antenna power (transmitter output power less transmission line loss) times (1) the antenna power gain, or (2) the antenna field gain squared.

L. *Service area*—The term "service area" as applied to FM broadcasting means the service resulting from an assigned effective radiated power and antenna height above average terrain.

M. *Antenna height above average terrain*—The term "antenna height above average terrain" means the average of the antenna heights above the terrain from two to ten miles from the antenna. (In general a different antenna height will be determined by each direction from the antenna. The average of these various heights is considered as the antenna height above average terrain.)

2. ENGINEERING STANDARDS OF ALLOCATION

A. Sections 3.202 to 3.205 inclusive of the Rules and Regulations describe the basis for allocation of FM Broadcast Stations, including the division of the United States into Areas I and II. Where reference is made in the Rules to antenna heights of Community Stations, Section 2 E (1) of these Standards should be consulted; for other classes of FM Broadcast Stations, Section 2 E (2) should be consulted.

As noted in Section 3.204 (b) of the Rules, the Commission will designate service areas for Metropolitan Stations in Area II. In addition to the showing required by this Rule a special showing must be included in the application concerning the area proposed to be served, in the event that (1) such area is smaller than the service area designated by the Commission, or (2) such area is smaller than that which would appear to be the appropriate service area, in cases where it has not been designated by the Commission. The proposed area to be served must be substantially greater than that which could be served by a Community station.

B. In determining the predicted and measured field intensity contours of FM broadcast stations the following shall govern:

(1) Community stations will normally not be required to determine their contours.

(2) Metropolitan Stations shall determine the extent of their 1000 uv/m and 50 uv/m contours.

(3) Rural stations shall determine their 1000 uv/m, 50 uv/m and 20 uv/m contours.*

The above contours shall be determined in accordance with the methods prescribed in these Standards.

C. Although some service is provided by tropospheric waves, the service area is considered to be only that served by the ground wave. The extent of the service is determined by the point at which the ground wave is no longer of sufficient intensity to provide satisfactory broadcast service. The field intensity considered necessary for service is as follows:

* The 20 uv/m contour is desired in this case for use by the Commission in determining the usability of a signal of such low intensity.

TABLE I

Area	Median Field Intensity
City business or factory areas	1000 uv/m
Rural areas	50 uv/m

A median field intensity of 3000 to 5000 uv/m should be placed over the principal city to be served, and a median field intensity of 1000 uv/m should be placed over the business district of cities of 10,000 or greater within the metropolitan district served. The field intensity to be provided over the main studio is specified by Sections 3.203, 3.204, and 3.205 of the Rules. These figures are based upon the usual noise levels encountered in the several areas and upon the absence of interference from other FM stations.

D. A basis for allocation of satellite stations has not yet been determined. For the present, applications will be considered on their individual merits.

E. The service area is predicted as follows:

(1) Community stations

A map, topographic where obtainable, shall be submitted for the area within 15 miles of the proposed antenna site. On this map shall be indicated the antenna location and a circle of 10 miles radius with the antenna location as center. Representative points shall be picked on this circle 15 degrees apart and the elevation of these points determined. The average elevation of these points will be considered the average elevation of the circle. The difference between the elevation of the center of the radiating system and the average elevation of this circle shall be considered the height of the antenna over the terrain 10 miles from the transmitter. In cases where the applicant believes this method to be grossly in error due to peculiarities of the terrain, this method shall be used for determining the antenna height but a showing may be made, if desired, determining the height by other means and describing the method used. Calculations of the service contours of Community stations are not required.

(2) Metropolitan and Rural stations

Profile graphs must be drawn for at least eight radials from the proposed antenna site. These profiles should be prepared for each radial beginning at the antenna site and extending to ten miles therefrom. Normally the radials are drawn for each 45° of azimuth; however, where feasible the radials should be drawn for angles along which roads tend to follow. (The latter method may be helpful in obtaining topographical data where otherwise unavailable, and is particularly useful in connection with mobile field intensity measurements of the station and correlation of such measurements with predicted field intensities). In each case one or more radials must include the principal city or cities to be served, particularly in cases of rugged terrain, even though the city may be more than 10 miles from the antenna site. The profile graph for each radial should be plotted by contour intervals of from 40 to 100 feet and where the data permits, at least 50 points of elevation (generally uniformly spaced) should be used for each radial. In instances of very rugged terrain where the use of contour intervals of 100 feet would result in several points in a short distance, 200 or 400 foot contour intervals may be used for such distances. On the other hand, where the terrain is uniform or gently sloping the smallest contour interval indicated on the topographic map (see below) should be used, although only a relatively few points may be available. The profile graph should accurately indicate the topography for each radial, and the graphs should be plotted with the distance in miles as the abscissa and the elevation in feet above mean sea level as the ordinate. The profile graphs should indicate the source of the topographical data employed. The graph should also show the elevation of the center of the radiating system. The graph may be plotted either on rectangular coordinate paper or on special paper which shows the curvature of the earth. It is not necessary to take the curvature of the earth into consideration in this procedure, as this factor is taken care of in the chart showing signal intensities (Figure 1).

The average elevation of the eight mile distance between two and ten miles from the antenna site should then be determined from the profile graph for each radial. This may be obtained by averaging a large number of equally spaced points, by using a planimeter, or by obtaining the median elevation (that exceeded for 50% of the distance) in sectors and averaging these values.

To determine the distance to a particular contour Figure 1 concerning the range of FM broadcast stations should be used. This chart has been prepared for a frequency in the center of the band and is to be used for all FM broadcast channels, since little change results over this frequency range. The distance to a contour is determined by the effective radiated power and the antenna height. The height of the antenna used in connection with Figure 1 should be the height of the center of the proposed antenna radiator above the average elevation obtained by the preceding method. The distances shown by Figure 1 are based upon an effective radiated power of one kilowatt; to use the chart for other powers, the sliding scale associated with the chart should be trimmed and used as the ordinate scale. This sliding scale is placed on the chart with the appropriate gradation for power in line with the lower line of the top edge of the chart. The right edge of the scale is placed in line with the appropriate antenna height graduations and the chart then becomes direct reading for this power and antenna height. Where the antenna height is not one of those for which a scale is provided, the signal strength or distance is determined by interpolation between the curves connecting the equidistant points.

The foregoing process of determining the extent of the required contours shall be followed in determining the boundary of the proposed service area. The areas within the required contours must be determined and submitted with each application for these classes of FM broadcast stations. Each application shall include a map showing these contours, and for this purpose Sectional Aeronautical charts or other maps having a convenient scale may be used. The map shall show the radials along which the profile charts and expected field strengths have been determined. The area within each contour should then be measured (by planimeter or other approximate means) to determine the number of square miles therein. In computing the area within the contours, exclude (1) areas beyond the borders of the United States, and (2) large bodies of water, such as ocean areas, gulfs, sounds, bays, large lakes, etc., but not rivers.

In cases where the terrain in one or more directions from the antenna site departs widely from the average elevation of the two to ten mile sector, the application of this prediction method may indicate contour distances that are different from those which may be expected in practice. In such cases the prediction method should be followed, but a showing may be made if desired concerning the distance to the contour as determined by other means. Such showing should include data concerning the procedure employed and sample calculations. For example, a mountain ridge may indicate the practical limit of service although the prediction method may indicate the contour elsewhere. In cases of such limitation, the map of predicted coverage should show both

the regular predicted area and the area as limited or extended by terrain. Both areas should be measured, as previously described; the area obtained by the regular prediction method should be given in the application form, with a supplementary note giving the limited or extended area. In special cases the Commission may require additional information as to the terrain in the proposed service area.

In determining the population served by FM broadcast stations, it is considered that the built-up city areas and business districts in cities having over 10,000 population and located beyond the 1,000 uv/m contour do not receive adequate service. Minor Civil Division maps (1940 Census) should be used in making population counts, excluding cities not receiving adequate service. Where a contour divides a minor division, uniform distribution of population within the division should be assumed in order to determine the population included within the contour, unless a more accurate count is available.

3. TOPOGRAPHICAL DATA

In the preparation of the profile graphs previously described, the elevations or contour intervals shall be taken from the U. S. Geological Topographical Quadrangle Sheets for all areas for which such maps are available. If such maps are not published for the area in question, the next best topographic information should be used. Topographic data may sometimes be obtained from state and municipal agencies. The data from the Sectional Aeronautical Charts (including bench marks), or railroad depot elevations and highway elevations from road maps, may be used where no better information is available. In cases where limited topographic data can be obtained, use may be made of an altimeter in a car driven along roads extending generally radially from the transmitter site.

The Commission will not ordinarily require the submission of topographical maps for areas beyond 15 miles from the antenna site, but the maps must include the principal city or cities to be served. If it appears necessary, additional data may be requested.

The U. S. Geological Survey Topography Quadrangle Sheets may be obtained from the U. S. Geological Survey, Department of the Interior, Washington, D. C., for ten cents each. The Sectional Aeronautical Charts are available from the U. S. Coast and Geodetic Survey, Department of Commerce, Washington, D. C., for twenty-five cents each. Other sources of topographic maps or data will be furnished at a later date.

4. INTERFERENCE STANDARDS

Field intensity measurements are preferable in predicting interference between FM broadcast stations and should be used, when available, in determining the extent of interference. (For methods and procedure, see Section 5). In lieu of measurements, the interference should be predicted in accordance with the method described herein.

Objectionable interference is considered to exist when the interfering signal exceeds that given by the ratios of Table II. In Table II the desired signal is median field and the undesired signal is the tropospheric signal intensity exceeding for 1% of the time.

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| Allocation Engineering | Engineering Service and |
| Antenna Design and Adjustment | Representation on Broadcasting |
| Field Intensity Measurements | AM, FM, Television |

STANDARDS OF GOOD ENGINEERING PRACTICE FOR FM STATIONS

(Continued from page 535)

TABLE II

Channel Separation	Ratio of Desired to Undesired Signals
Same channel	10:1
Adjacent channel (200 kc removed)	2:1

Objectionable interference is not considered to exist when the channel separation is 400 kc or greater. Accordingly, FM broadcast stations in the same city or same area may be assigned channels 400 kc apart. In the assignment of FM broadcast facilities the Commission will endeavor to provide the optimum use of the channels in the band, and accordingly may assign a channel different than that requested in an application.

In predicting the extent of interference within the ground wave service area of a station, the tropospheric signal intensity (from co-channel and adjacent channel stations) existing for one percent of the time shall be employed. The one percent values for one kilowatt of power and various antenna heights are given in Figure 2, and values for other powers may be obtained by use of the sliding scale as for Figure 1. The values indicated by Figure 2 are based upon available data, and are subject to change as additional information concerning tropospheric wave propagation is obtained.*

In determining the points at which the interference ratio is equal to the values shown in Table II, the field intensities for the two interfering signals under consideration should be computed for a considerable number of points along the line between the two stations. Using this data, field intensity versus distance curves should be plotted (e.g., cross-curves on graph paper) in order to determine the points on this path where the interference ratios exist. The points established by this method, together with the points along the contours where the same ratios are determined, are considered to be generally sufficient to predict the area of interference. Additional points may be required in the case of irregular terrain or the use of directional antenna systems.

The area of interference, if any, shall be shown in connection with the map of predicted coverage required by the application form, together with the basic data employed in computing such interference. The map shall show the interference within the 50 uv/m contour.

5. FIELD INTENSITY MEASUREMENTS IN ALLOCATION

When field intensity measurements are required by the Commission's rules or when employed in determining the extent of service or interference of existing stations, such measurements should be made in accordance with the procedure outlined herein.

Measurements made to determine the service and interference areas of FM broadcast stations should be made with mobile equipment along roads which are as close and similar as possible to the radials showing topography which were submitted with the application for construction permit. Suitable measuring equipment and a continuous recording device must be employed, the chart of which is either directly driven from the speedometer of the automobile in which the equipment is mounted or so arranged that distances and identifying landmarks may be readily noted. The measuring equipment must be calibrated against recognized standards of field intensity and so constructed that it will maintain an acceptable accuracy of measurement while in motion or when stationary. The equipment should be so operated that the recorder chart can be calibrated directly in field intensity in order to facilitate analysis of the chart. The receiving antenna must be non-directional and of the same polarization as the transmitting antenna.

Mobile measurements should be made with a minimum chart speed of 3 inches per mile and preferably 5 or 6 inches per mile. Locations shall be noted on the recorder chart as frequently as necessary to definitely fix the relation between the measured field intensity and the location. The time constant of the equipment should be such to permit adequate analysis of the charts, and the time constant employed shall be shown. Measurements should be made to a point on each radial well beyond the particular contour under investigation. The transmitter power shall be maintained as close as possible to the authorized power throughout the survey.

After the measurements are completed, the recorder chart shall be divided into not less than 15 sections on each equivalent radial from the station. The field intensity in each section of the chart shall be analyzed to determine the field intensity received 50 percent of the distance (median field) throughout the section, and this median field intensity associated with the corresponding sector of the radial. The field intensity figures must be corrected for a receiving antenna elevation of thirty feet and for any directional effects of the automobile not otherwise compensated. This data should be plotted for each radial, using log-coordinate paper with distance as the abscissa and field intensity as the ordinate. A smooth curve should be drawn through these points (of median fields for all sectors), and this curve used to determine the distance to the desired contour. The distances obtained for each radial may then be plotted on the map of predicted coverage or on polar coordinate paper (excluding water areas, etc.) to determine the service and interference areas of a station.

In making measurements to establish the field intensity contours of a station, mobile recordings should be made along each of the radials drawn in Section 2 E above. Measurements should extend from the vicinity of the station out to the 1000 uv/m measured contour and somewhat beyond (at the present time it is not considered practical to conduct mobile measurements far beyond this contour due to the fading ratio at weak fields, which complicates analysis of the charts). These measurements would be made for the purpose of determining the variation of the measured contours from those predicted, and it is expected that initially the correlation of the measured 1000 uv/m with the predicted 1000 uv/m contour will be used as a basis in determining adherence to authorized service areas within the 50 uv/m contour. Adjustment of power or antenna may be required to fit the actual contours to that predicted.

In addition to the 1000 uv/m contour, the map of measured coverage shall show the 50 uv/m contour as determined by employing Figure 1 and the distance to the 1000 uv/m contour along each radial. The sliding scale shall be placed on the figure at the appropriate antenna height for the radial in question and then moved so the distance to the 1000 uv/m contour (as measured) and the 1000 uv/m mark are opposite. The distance to the 50 uv/m contour is then given opposite the 50 uv/m mark on the scale.

In predicting tropospheric interference on the basis of the above measurements, such measurements shall be carried out in the manner indicated above to determine the 1000 uv/m contour. Using Figure 1 and its associated sliding scale, the equivalent radiated power shall be determined by placing the sliding scale on the chart (using the appropriate antenna height) and moving the scale until the distance to the 1000 uv/m contour (as determined above), and the 1000 uv/m mark are opposite. The equivalent radiated power is then read from the sliding scale where it crosses the lower line of the top edge of the chart. Changing to Figure 2 and using the equivalent radiated power just determined, the distance to the interfering contour under investigation is read in the usual manner.

In certain cases the Commission may desire more information or recordings and in these instances special instructions will be issued. This may include fixed location measurements to determine tropospheric propagation and fading ratios.

Complete data taken in conjunction with field intensity measurements shall be submitted to the Commission in affidavit form, including the following:

A. Map or maps showing the roads or points where measurements were made, the service and/or interference areas determined by the prediction method and by the measurements, and any unusual terrain characteristics existing in these areas. (This map may preferably be of a type showing topography in the area).

B. If a directional transmitting antenna is employed, a diagram on polar coordinate paper showing the predicted free space field intensity in millivolts per meter at one mile in all directions. (See Section 7).

C. A full description of the procedures and methods employed including the type of equipment, the method of installation and operation, and calibration procedures.

D. Complete data obtained during the survey, including calibration.

E. Antenna system and power employed during the survey.

F. Name, address, and qualifications of the engineer or engineers making the measurements.

All data shall be submitted to the Commission in triplicate, except that only the original or one photostatic copy need be submitted of the actual recording tapes.

6. TRANSMITTER LOCATION

A. The transmitter location should be as near the center of the proposed service area as possible consistent with the applicant's ability to find a site with sufficient elevation to provide service throughout the area. Location of the antenna at a point of high elevation is necessary to reduce to a minimum the shadow effect on propagation due to hills and buildings which may reduce materially the intensity of the station's signals in a particular direction. The transmitting site should be selected consistent with the purpose of the station, i.e., whether it is intended to serve a small city, a metropolitan area or a large region. Inasmuch as service may be provided by signals of 1000 uv/m or greater field intensities in metropolitan areas, and inasmuch as signals as low as 20 uv/m may provide service in rural areas, considerable latitude in the geographical location of the transmitter is permitted; however, the necessity for a high elevation for the antenna may render this problem difficult. In general, the transmitting antenna of a station should be located at the most central point at the highest elevation available. In providing the best degree of service to an area, it is usually preferable to use a high antenna rather than a lower antenna with increased transmitter power. The location should be so chosen that line-of-sight can be obtained from the antenna over the principal city or cities to be served; in no event should there be a major obstruction in this path.

B. The transmitting location should be selected so that the 100 uv/m contour encompasses the urban population within the area to be served and the 50 uv/m or the interference free contour coincides generally with the limits of the area to be served. It is recognized that topography, shape of the desired service area, and population distribution may make the choice of a transmitter location difficult. In such cases consideration may be given to the use of a directional antenna system, although it is generally preferable to choose a site where a non-directional antenna may be employed.

C. In cases of questionable antenna locations it is desirable to conduct propagation tests to indicate the field intensity expected in the principal city or cities to be served and in other areas, particularly where severe shadow problems may be expected. In considering applications proposing the use of such locations, the Commission may require site tests to be made. Such tests should be made in accordance with the measurement procedure previously described, and full data thereon must be supplied to the Commission. Test transmitters should employ an antenna having a height as close as possible to the proposed antenna height, using a balloon or other support if necessary and feasible. Information concerning the authorization of site tests may be obtained from the Commission upon request.

D. Present information is not sufficiently complete to establish "blanket areas" of FM broadcast stations, which are defined as those areas adjacent to the transmitters in which the reception of other stations is subject to interference due to the strong signal from the stations. Where it is found necessary to locate the transmitter in a residential area where blanketing problems may appear to be excessive, the application must include a showing concerning the availability of other sites. The authorization of station construction in areas where blanketing problems appear to be excessive will be on the basis that the applicant will assume full responsibility for the adjustment of reasonable complaints arising from excessively strong signals of the applicant's station. As a means of minimizing interference problems, it is expected that stations adjacent in location will generally be assigned frequencies that are generally adjacent. Insofar as is feasible, frequency assignments for stations at separated locations will also be separated.

Cognizance must of course be taken regarding the possible hazard of the proposed antenna structure to aviation and the proximity of the proposed site to airports and airways. In passing on proposed construction, the Commission refers each case to the CAA for its recommendations. Antenna painting and/or lighting may be required at the time of construction or at a later date.

7. ANTENNA SYSTEMS

A. It shall be standard to employ horizontal polarization. If the use of vertical polarization appears desirable in special circumstances, its use may be authorized upon a showing of need.

B. The antenna must be constructed so that it is as clear as possible of surrounding buildings or objects that would cause shadow problems.

C. Applications proposing the use of directional antenna systems must be accompanied by the following:

- (1) Complete description of the proposed antenna system.
- (2) Orientation of array with respect to true north; time phasing of fields from elements (degrees leading or lagging); space phasing of elements (in feet and in degrees); ratio of fields from elements.
- (3) Calculated field intensity pattern (on letter-size polar coordinate paper) giving the free space field intensity in millivolts per meter at one mile in the horizontal plane, together with the formula used, constants employed, sample calculations and tabulation of calculation data.

(4) Name, address, and qualifications of the engineer making the calculations.
 D. Applications proposing the use of FM broadcast antennas in the immediate vicinity (i.e., 200 feet or less) of (1) other FM broadcast antennas, or (2) television broadcast antennas for frequencies adjacent to the FM broadcast band, must include a showing as to the expected effect, if any, of such proximate operation.

In cases where it is proposed to use a tower of a standard broadcast station as a supporting structure for an FM broadcast antenna, an application for construction permit (or modification of construction permit) for such station must be filed for consideration with the FM application. Applications may be required for other classes of stations when their towers are to be used in connection with FM broadcast stations.

When an FM broadcast antenna is mounted on a non-directional standard broadcast antenna, new resistance measurements must be made of the standard broadcast antenna after installation and testing of the FM broadcast antenna. During the installation and until the new resistance determination is approved, the standard broadcast station licensee should apply for authority (informal application) to operate by the indirect method of power determination. The FM broadcast license application will not be considered until the application form concerning resistance measurements is filed for the standard broadcast station.

When an FM broadcast antenna is mounted on an element of a standard broadcast directional antenna, a full engineering study concerning the effect of the FM broadcast antenna on the directional pattern must be filed with the application concerning the standard broadcast station. Depending upon the individual case, the Commission may require readjustment and certain field intensity measurements of the standard broadcast station following the completion of the FM broadcast antenna system.

When the proposed FM broadcast antenna is to be mounted on a tower in the vicinity of a standard broadcast directional array and it appears that the operation of the directional antenna system may be affected, an engineering study must be filed with the FM broadcast application concerning the effect of the FM broadcast antenna on the directional pattern. Readjustment and field intensity measurements of the standard broadcast station may be required following construction of the FM broadcast antenna.

Information regarding data required in connection with standard broadcast directional antenna systems may be found in the Standards of Good Engineering Practice Concerning Standard Broadcast Stations.

In the event a common tower is used by two or more licensees for antenna and/or antenna supporting purposes, the licensee who is owner of the tower shall assume full responsibility for the installation and maintenance of any painting or lighting requirements. In the event of shared ownership, one licensee shall assume such responsibility and advise the Commission accordingly.

E. It is recommended that an emergency FM broadcast antenna be installed, or, alternately, an auxiliary transmission line or lines if feasible in the particular circumstances. Data thereon should be supplied with the application for construction permit; if proposed after station construction, an informal application should be submitted to the Commission.

F. When necessary for the protection of air navigation, the antenna and supporting structure shall be painted and illuminated in accordance with the specifications supplied by the Commission pursuant to section 303 (q) of the Communications Act of 1934, as amended.

These individual specifications are issued for and attached to each authorization for an installation. The details of the specifications depend on the degree of hazard presented by the particular installation. The tower paint shall be kept in good condition and repainted as often as necessary to maintain this condition.

General information regarding painting and lighting requirements is contained in the Obstruction Marking Manual available from the Civil Aeronautics Administration, Washington 25, D. C.

8. TRANSMITTERS AND ASSOCIATED EQUIPMENT

A. Electrical Performance Standards—The general design of the FM broadcast transmitting system (from input terminals of microphone pre-amplifier.

through audio facilities at the studio, through lines or other circuits between studio and transmitter, through audio facilities at the transmitter, and through the transmitter, but excluding equalizers for the correction of deficiencies in microphone response) shall be in accordance with the following principles and specifications:

(1) Standard power ratings and operating power range of FM broadcast transmitters shall be in accordance with the following table:

Standard Power Rating	Operating Power Range
250 watts	250 watts or less
1 kw	250 watts— 1 kw
3 kw	1— 3 kw
10 kw	3— 10 kw
25 kw	10— 25 kw
50 kw	10— 50 kw
100 kw	50—100 kw

Composite transmitters may be authorized with a power rating different from the above table, provided full data is supplied in the application concerning the basis employed in establishing the rating and the need therefor. The operating range of such transmitters shall be from one-third of the power rating to the power rating.

The transmitter shall operate satisfactorily in the operating power range with a frequency swing of ± 75 kilocycles, which is defined as 100% modulation.

(2) The transmitting system shall be capable of transmitting a band of frequencies from 50 to 15,000 cycles. Pre-emphasis shall be employed in accordance with the impedance-frequency characteristic of a series inductance-resistance network having a time constant of 75 microseconds. (See Figure 3). The deviation of the system response from the standard pre-emphasis curve shall lie between two limits as shown in Figure 3. The upper of these limits shall be uniform (no deviation) from 50 to 15,000 cycles. The lower limit shall be uniform from 100 to 7,500 cycles, and three db below the upper limit; from 100 to 50 cycles the lower limit shall fall from the three db limit at a uniform rate of one db per octave (four db at 50 cycles); from 7500 to 15,000 cycles the lower limit shall fall from the three db limit at a uniform rate of two db per octave (five db at 15,000 cycles).

(3) At any modulation frequency between 50 and 15,000 cycles and at modulation percentages of 25%, 50%, and 100%, the combined audio frequency harmonics measured in the output of the system shall not exceed the root-mean-square values given in the following table:

Modulating frequency	Distortion
50 to 100 cycles	3.5%
100 to 7500 cycles	2.5%
7500 to 15000 cycles	3.0%

Measurements shall be made employing 75 microsecond de-emphasis in the measuring equipment and 75 microsecond pre-emphasis in the transmitting equipment, and without compression if a compression amplifier is employed. Harmonics shall be included to 30 kc.*

It is recommended that none of the three main divisions of the system (transmitter, studio to transmitter circuit, and audio facilities) contribute over one half of these percentages since at some frequencies the total distortion may become the arithmetic sum of the distortions of the divisions.

(4) The transmitting system output noise level (frequency modulation) in the band of 50 to 15,000 cycles shall be at least 60 decibels below the audio frequency level representing a frequency swing of ± 75 kilocycles. The noise-measuring equipment shall be provided with standard 75-microsecond de-emphasis; the ballistic characteristics of the instrument shall be similar to those of the Standard VU Meter.

(5) The transmitting system output noise level (amplitude modulation) in the band of 50 to 15,000 cycles shall be at least 50 decibels below the level representing 100% amplitude modulation. The noise-measuring equipment shall be provided with standard 75-microsecond de-emphasis; the ballistic characteristics of the instrument shall be similar to those of the Standard VU Meter.

(6) Automatic means shall be provided in the transmitter to maintain the assigned center frequency within the allowable tolerance (± 2000 cycles).

(7) The transmitter shall be equipped with suitable indicating instruments

* See Section 13 for measurement frequencies and other information.

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for the determination of operating power and with other instruments as are necessary for proper adjustment, operation, and maintenance of the equipment (See Section 9).

(8) Adequate provision shall be made for varying the transmitter output power to compensate for excessive variations in line voltage or for other factors affecting the output power.

(9) Adequate provision shall be provided in all component parts to avoid overheating at the rated maximum output power.

(10) Means should be provided for connection and continuous operation of approved frequency and modulation monitors.

(11) If a limiting or compression amplifier is employed, precaution should be maintained in its connection in the circuit due to the use of pre-emphasis in the transmitting system.

B. Construction. In general, the transmitter shall be constructed either on racks and panels or in totally enclosed frames protected as required by article 810¹ of the National Electrical Code and set forth below:

(1) Means shall be provided for making all tuning adjustments, requiring voltages in excess of 350 volts to be applied to the circuit, from the front of the panels with all access doors closed.

(2) Proper bleeder resistors or other automatic means shall be installed across all capacitor banks to lower any voltage which may remain accessible with access door open to less than 350 volts within two seconds after the access door is opened.

(3) All plate supply and other high voltage equipment, including transformers, filters, rectifiers and motor generators, shall be protected so as to prevent injury to operating personnel.

(a) Commutator guards shall be provided on all high voltage rotating machinery. Coupling guards should be provided on motor generators.

(b) Power equipment and control panels of the transmitter shall meet the above requirements (exposed 220 volt AC switching equipment on the front of the power control panels is not recommended but is not prohibited).

(c) Power equipment located at a broadcast station but not directly associated with the transmitter (not purchased as part of same), such as power distribution panels, are not under the jurisdiction of the Commission; therefore Section 3.254 does not apply.

(4) Metering equipment:

(a) All instruments having more than 1,000 volts potential to ground on the movement shall be protected by a cage or cover in addition to the regular case. (Some instruments are designed by the manufacturer to operate safely with voltages in excess of 1,000 volts on the movement. If it can be shown by the manufacturer's rating that the instrument will operate safely at the applied potential, additional protection is not necessary.)

(b) In case the plate voltmeter is located on the low potential side of the multiplier resistor with the potential of the high potential terminal of the instrument at or less than 1,000 volts above ground, no protective case is required. However, it is good practice to protect voltmeters subject to more than 5,000 volts with suitable over-voltage protective devices across the instrument terminals in case the winding opens.

(c) Transmission line meters and any other radio frequency instrument which may be necessary for the operator to read shall be so installed as to be easily and accurately read without the operator having to risk contact with circuits carrying high potential radio frequency energy.

(5) It is recommended that component parts comply as much as possible with the component specifications designated by the Army-Navy Electronics Standards Agency.

C. Wiring and shielding

(1) The transmitter panels or units shall be wired in accordance with standard switchboard practice, either with insulated leads properly cabled and supported or with rigid bus bar properly insulated and protected.

(2) Wiring between units of the transmitter, with the exception of circuits carrying radio frequency energy, shall be installed in conduits or approved fiber or metal raceways for protection from mechanical injury.

(3) Circuits carrying radio frequency energy between units shall be coaxial, two wire balanced lines, or properly shielded.

(4) All stages or units shall be adequately shielded and filtered to prevent interaction and radiation.

(5) The frequency and modulation monitors and associated radio frequency lines to the transmitter shall be thoroughly shielded.

D. Installation

(1) The installation shall be made in suitable quarters.

(2) Since an operator must be on duty during operation, suitable facilities for his welfare and comfort shall be provided.

E. Spare tubes. A spare tube of every type employed in the transmitter and frequency and modulation monitors shall be kept on hand at the equipment location. When more than one tube of any type are employed, the following table determines the number of spares of that type required:

Number of each type employed:	Spares required
1 or 2	1
3 to 5	2
6 to 8	3
9 or more	4

¹ The pertinent sections of article 810 of the National Electrical Code read as follows:

"8191. General.—Transmitters shall comply with the following:

"a. Enclosing.—The transmitter shall be enclosed in a metal frame or grille, or separated from the operating space by a barrier or other equivalent means, all metallic parts of which are effectually connected to ground.

"b. Grounding of controls.—All external metallic handles and controls accessible to the operating personnel shall be effectually grounded. No circuit in excess of 150 volts shall have any parts exposed to direct contact. A complete dead-front type of switchboard is preferred.

"c. Interlocks on doors.—All access doors shall be provided with interlocks which will disconnect all voltages in excess of 350 volts when any access door is opened."

An accurate circuit diagram and list of required spare tubes, as furnished by the manufacturer of the equipment, shall be retained at the transmitter location.

F. Operation. In addition to specific requirements of the rules governing FM broadcast stations, the following operating requirements are specified:

(1) The maximum percentage of modulation shall be maintained in accordance with Section 3.268. However, precautions shall be taken so as not to substantially alter the dynamic characteristics of musical programs.

(2) Spurious emissions, including radio frequency harmonics, shall be maintained at as low a level as practicable at all times in accordance with good engineering practice.

(3) If a limiting or compression amplifier is employed, care should be maintained in its use due to pre-emphasis in the transmitting system.

G. Studio Equipment. Studio equipment shall be subject to all the above requirements where applicable except as follows:

(1) If properly covered by an underwriter's certificate, it will be considered as satisfying safety requirements.

(2) Section 8191 of Article 810 of the National Electrical Code shall apply for voltages only in excess of 500 volts.

No specific requirements are made with regards to the microphones to be employed. However, microphone performance (including compensating networks, if employed) shall be compatible with the required performance of the transmitting system.

No specific requirements are made relative to the design and acoustical treatment of studios. However, the design of studios, particularly the main studio, shall be compatible with the required performance characteristics of FM broadcast stations.

9. INDICATING INSTRUMENTS

An FM broadcast transmitter shall be equipped with suitable indicating instruments of acceptable accuracy to measure (1) the direct plate voltage and current of the last radio stage, and (2) the main transmission line radio frequency current or voltage.

The following requirements and specifications shall apply to indicating instruments used by FM broadcast stations:

A. Instruments indicating the plate current or plate voltage of the last radio stage (linear scale instruments) shall meet the following specifications:

(1) Length of scale shall be not less than 2 3/10 inches.

(2) Accuracy shall be at least 2 percent of the full scale reading.

(3) Scale shall have at least 40 divisions.

(4) Full scale reading shall not be greater than five times the minimum normal indication.

B. Instruments indicating transmission line current or voltage shall meet the following specifications:

(1) Instruments having linear scales shall meet the requirements of A (1), (2), (3), and (4) above.

(2) Instruments having logarithmic or square law scales.

(a) Shall meet requirements A(1) and (2) for linear scale instruments.

(b) Full scale reading shall not be greater than three times the minimum normal indication.

(c) No scale division above one-third full scale reading (in amperes) shall be greater than one-thirtieth of the full scale reading.

C. Radio frequency instruments having expanded scales.

(1) Shall meet requirements A (1), (2), and (4) for linear scale instruments.

(2) No scale division above one-fifth full scale reading (in amperes) shall be greater than one-fiftieth of the full scale reading.

(3) The meter face shall be marked with the words 'Expanded Scale' of the abbreviation thereof (E. S.).

D. No instruments indicating the plate current or plate voltage of the last radio stage or the transmission line current or voltage shall be changed or replaced without written authority of the Commission, except by instruments of the same maximum scale readings and accuracy. Requests for authority to use an instrument of different maximum scale reading and/or accuracy shall be made by letter or telegram giving the manufacturer's name, type number, and full scale reading of the proposed instrument and the values of current or voltage the instrument will be employed to indicate. Requests for temporary authority to operate without an instrument may be made by letter or telegram stating the necessity therefor and the period involved.

E. No required instrument, the accuracy of which is questionable, shall be employed. Repairs and recalibration of instruments shall be made by the manufacturer, or by an authorized instrument repair service of the manufacturer, or by some other properly qualified and equipped instrument repair service. In any event the repaired instrument must be supplied with a certificate of calibration.

F. Recording instruments may be employed in addition to the indicating instruments to record the transmission line current or voltage and the direct plate current and/or direct plate voltage of the last radio stage, provided that they do not affect the operation of the circuits or accuracy of the indicating instruments. If the records are to be used in any proceeding before the Commission as representative of operation, the accuracy must be the equivalent of the indicating instruments and the calibration shall be checked at such intervals as to insure the retention of the accuracy.

G. The function of each instrument used in the equipment shall be clearly and permanently shown on the instrument itself or on the panel immediately adjacent thereto.

10. AUXILIARY TRANSMITTERS

Auxiliary transmitters may not exceed the power rating or operating power range of the main transmitter, but need not conform to the performance characteristic specified by Section 8 A (2) to 8 A (5) inclusive. The subsequent portions of Section 8 apply to auxiliary transmitters.

11. OPERATING POWER: DETERMINATION AND MAINTENANCE

A. The operating power of FM broadcast stations shall be determined by the indirect method. This is the product of the plate voltage (E_p) and the plate current (I_p) of the last radio stage, and an efficiency factor, F ; that is:

$$\text{Operating power} = E_p \times I_p \times F$$

The efficiency factor, F , shall be established by the transmitter manufacturer for each type of transmitter for which he requests FCC approval, and shall be shown in the instruction books supplied to the customer with each transmitter. In the case of composite equipment the factor F shall be furnished to the Commission by the applicant along with a statement of the basis used in determining such factor.

B. The operating power shall be maintained as near as practicable to the authorized operating power, and shall not exceed the limits of 5 percent above and 10 percent below the authorized power except in emergencies. In the event it becomes impossible to operate with the authorized power, the station may be operated with reduced power for a period of 10 days or less provided the Commission and the Inspector in Charge¹ of the district in which the station is located shall be notified in writing immediately thereafter and also upon the resumption of normal operating power.

12. FREQUENCY AND MODULATION MONITORS AT AUXILIARY TRANSMITTERS

Sections 3.252 and 3.253 require that each FM broadcast station have approved frequency and modulation monitors in operation at the transmitter. The following shall govern the installation of approved frequency and modulation monitors at auxiliary transmitters of FM broadcast stations in compliance with these rules:

In case the auxiliary transmitter location is at a site different from that of the main transmitter, an approved frequency monitor shall be installed at the auxiliary transmitter except when the frequency of the auxiliary transmitter can be monitored by means of the frequency monitor at the main transmitter. When the auxiliary transmitter is operated without a frequency monitor under this exemption, it shall be monitored by means of the frequency monitor at the main transmitter.

The licensee will be held strictly responsible for any center frequency deviation of the auxiliary transmitter in excess of 2000 cycles from the assigned frequency, even though exempted by the above from installing an approved frequency monitor.

Installation of an approved modulation monitor at the location of the auxiliary transmitter, when different from that of the main transmitter, is optional with the licensee. However, when it is necessary to operate the auxiliary transmitter beyond two calendar days, a modulation monitor shall be installed and operated at the auxiliary transmitter. The monitor (if taken from the main transmitter) shall be reinstalled at the main transmitter immediately upon resumption of operation of the main transmitter.

In all cases where the auxiliary transmitter and the main transmitter have the same location, the same frequency and modulation monitors may be used for monitoring both transmitters, provided they are so arranged as to be readily switched from one transmitter to the other.

13. * REQUIREMENTS FOR TYPE APPROVAL OF TRANSMITTERS

Section 3.254 of the Rules and Section 8 of these Standards concern the design, construction and technical operation of FM broadcast station equipment. In order to facilitate the filing of and action on applications for construction permits specifying equipment of standard manufacture, the Commission will approve, as complying with the technical requirements, such equipment by type, subject to the following conditions and in accordance with the following procedure:

A. Approval of equipment by the Commission is only to the effect that insofar as can be determined from the data supplied, the equipment complies with the current requirements of good engineering practice and the current technical Rules and Regulations of the Commission. The approval may be withdrawn upon subsequent inspection or operation showing the equipment is not as represented or does not comply with the technical Rules and Regulations of the Commission and the requirements of good engineering practice.

B. Such approval shall not be construed to mean that the equipment will be satisfactory as the state of the art progresses and/or as the Rules and Regulations of the Commission may be changed as deemed advisable.

C. Applicants specifying equipment of approved manufacture need not submit detailed descriptions and diagrams where the correct type number is specified provided that the equipment proposed is identical with that approved.

D. In passing on equipment, no consideration is given by the Commission to patent rights.

E. For approval of FM broadcast transmitters, manufacturers shall submit FCC Form 319 completed with respect to all pertinent sections (two sworn copies). In addition or included therein shall be the data set forth below, all of which shall be verified before a notary public.**

(1) Photographs or drawings, or any other evidence that construction is in accordance with the requirements of good engineering practice.

(2) Data and curves showing overall audio frequency response from 50 to 15,000 cycles for approximately 25, 50 and 100 percent modulation. Measurements shall be made on at least the following modulation frequencies: 50, 100, 400, 5000, 10,000 and 15,000 cycles. This shall be plotted below a standard 75 microsecond pre-emphasis curve (see Figure 3).

(3) Data on audio frequency harmonics for 25, 50 and 100 percent modulation for the fundamental frequencies of 50, 100, 400, 1000 and 5000 cycles. Data on audio frequency harmonics for 100 percent modulation for fundamental frequencies of 10,000 and 15,000 cycles. Measurements shall include harmonics to 30,000 cycles. (Measurements at 10,000 and 15,000 cycles at 25 and 50 percent modulation are not practical at this time, due to the de-emphasis in the measuring equipment.)

(4) Carrier hum and extraneous noise (AM and FM) generated within the equipment and measured as the level below 100 percent modulation.

(5) Means of varying output power to compensate for power supply voltage variations.

(6) Data and curves on mean frequency stability for variations in ambient temperatures over the ranges encountered in practice.

(7) Data and curves on frequency stability for variations in power supply voltage from 85 to 115 percent normal.

(8) Net sale price.

F. In case any manufacturer decides to produce a 100 kw transmitter and submit data on it for approval, or any power rating not listed as standard he shall give notice to the Commission which will release by public notice the manufacturer's name and the standard power rating of the transmitter to be produced at least six months prior to the delivery date or completion of such transmitter.

14. * REQUIREMENTS FOR TYPE APPROVAL OF FREQUENCY MONITORS

Section 3.252 of the Rules requires each FM broadcast station to have in operation, at the transmitter, an approved frequency monitor independent of the frequency control of the transmitter. The frequency monitor shall be approved by the Commission and shall have a stability and accuracy of at least one-half (± 1000 cycles) of the permitted frequency deviation of the FM broadcast station. Visual indication of the operating frequency shall be provided.

A. General Requirements

In general a frequency monitor for FM broadcast stations requires a stable source of radio frequency energy whose frequency is accurately known and a means of comparing the transmitter center frequency with this stable source. The visual indicator is calibrated to indicate the deviation of the transmitter center frequency from the frequency assigned.

Approval of a frequency monitor for FM broadcast stations will be considered on the basis of data submitted by the manufacturer. Any manufacturer desiring to submit a monitor for approval shall supply the Commission with full details (two sworn copies).

In approving a frequency monitor based on these tests and specifications, the Commission merely recognizes that the type of monitor has the inherent capability of functioning in compliance with Section 3.252, if properly constructed, maintained and operated. The Commission accepts no responsibility beyond this and further realizes that monitors may have a limited range over which the visual indicator will determine deviations. Accordingly, it may be necessary that adjunct equipment be used to determine major deviations.

No change whatsoever will be permitted in the monitors sold under approval number issued by the Commission except when the licensee or the manufacturer is specifically authorized to make such changes. When it is desired to make any change, either mechanical or electrical, the details shall be submitted to the Commission for its consideration.

Approval is given subject to withdrawal if the unit proves defective in service and cannot be relied upon under usual conditions of maintenance and operation encountered in the average FM broadcast station. Withdrawal of approval means that no further units may be installed by FM broadcast stations for the purpose of complying with Section 3.252; however, this will not affect units already sold unless it is found that there has been an unauthorized change in design or construction or that the material or workmanship is defective.

B. General Specifications.

The general specifications that frequency monitors shall meet before they will be approved by the Commission are as follows:

(1) The unit shall have an accuracy of at least ± 1000 cycles under ordinary conditions (temperature, humidity, power supply variations and other conditions which may affect its accuracy) encountered in FM broadcast stations throughout the United States for any channel within the FM broadcast band.

(2) The range of the indicating device shall be at least from 2000 cycles below to 2000 cycles above the assigned center frequency.

(3) The scale of the indicating device shall be so calibrated as to be accurately read within at least 100 cycles.

(4) Means shall be provided for adjustment of the monitor indication to agree with an external standard.

(5) The monitor shall be capable of continuous operation and its circuit shall be such as to permit continuous monitoring of the transmitter center frequency.

(6) Operation of the monitor shall have no deleterious effect on the operation of the transmitter or the signal emitted therefrom.

C. Tests to be made for approval of FM broadcast frequency monitors.

The manufacturer of a monitor shall submit data on the following at the time of requesting approval:

(1) Constancy of oscillator frequency, as measured several times in one month.

(2) Constancy of oscillator frequency when subjected to vibration tests which would correspond to the treatment received in shipping, handling and installing the instrument.

(3) Accuracy of readings of the frequency deviation instrument.

(4) Functioning of frequency adjustment device.

(5) Effects on frequency and readings, of the changing of tubes, of voltage variations, and of variations of room temperature through a range not to exceed 10° to 40° C.

(6) Response of indicating instrument to small changes of frequency.

(7) General information on the effect of tilting or tipping or other tests to determine ability of equipment to withstand shipment.

Various other tests may be made or required, such as effects of variation of input from the transmitter depending upon the character of the apparatus.

Tests shall be conducted in such a manner as to approximate actual operating conditions as nearly as possible. The equipment under test shall be operated on any channel in the FM broadcast band.

15. REQUIREMENTS FOR TYPE APPROVAL OF MODULATION MONITORS

Section 3.253 requires each FM broadcast station to have an approved modulation monitor in operation at the transmitter. This monitor may or may not be a part of the FM broadcast frequency monitor. Approval of a modulation monitor for FM broadcast stations will be considered on the basis of data submitted by the manufacturer. Any manufacturer desiring to submit a monitor for approval shall supply the Commission with full details (two sworn copies).

The specifications that the modulation monitor shall meet before they will be approved by the Commission are as follows:*

A. A means for insuring that the transmitter input to the modulation monitor is proper.

B. A modulation peak indicating device that can be set at any pre-determined value from 50 to 120 percent modulation (plus-minus 75 kc swing is defined as 100 percent modulation) and for either positive or negative swings (i.e., either above or below transmitter center frequency).

C. A semi-peak indicator with a meter having the characteristics given below shall be used with a circuit such that peaks of modulation of duration between 40 and 90 milliseconds are indicated to 90 percent of full value and the discharge rate adjusted so that the pointer returns from full reading to 10 percent of zero within 500 to 800 milliseconds. A switch shall be provided so that this meter will read either positive or negative swings.

The characteristics of the indicating meter are as follows: Speed—The time for one complete oscillation of the pointer shall be 290 to 350 milliseconds.

The damping factor shall be between 16 and 200.

* In connection with this type approval of FM equipment, the Commission may send a representative to observe tests made of such equipment by the manufacturer.