

duties, as set forth in paragraph (a) of this section, and in the rules and regulations applicable to each service.

(c) One or more verified statements (Form 759), as necessary, will be issued to the holder of a restricted radiotelephone operator permit (card form license) who because of an operator license posting requirement at one station would not otherwise be able to comply with a license posting requirement or to carry his permit on his person when so required at another station or stations.

§ 13.75 Record of service and maintenance duties performed.

In every case where a station log or service and maintenance records are required to be kept, and where service or maintenance duties are performed which may affect the proper operation of a station, the responsible operator shall sign and date an entry in the log of the station concerned, or in the station maintenance records if no log is required, giving:

(a) Pertinent details of all service and maintenance work performed by him or under his supervision;

(b) His name and address; and

(c) The class, serial number and expiration date of his license:

Provided, That the responsible operator shall not be subject to requirements of paragraphs (b) and (c) of this section in relation to a station, or stations of one licensee at a single location, at which he is regularly employed as an operator on a full time basis and at which his license is properly posted.

§ 13.76 Limitation on aircraft pilots.

Notwithstanding any other provisions of this part, a license issued to an alien aircraft pilot pursuant to section 303(l) of the Communications Act shall be valid only for such operation of radio stations on aircraft as is complementary to his functions and duties as a pilot.

SERVICE

§ 13.91 Endorsement of service record.

A station licensee, or his duly authorized agent, or the master of a vessel acting as the agent of a licensee, shall endorse the service record appearing on said operator license, showing the call letters and types of emission of the station operated, the nature and period of employment, and quality of performance of duty.

§ 13.92 Aviation service endorsement.

If the operator has operated more than three stations in the aviation service, the service may be shown by giving the name of the aviation chain or company in lieu of listing the call letters of the several stations.

§ 13.93 Service acceptability.

Credit will be allowed only for satisfactory service obtained under conditions that required the employment of licensed operators, or when obtained at United States Government stations.

§ 13.94 Statement in lieu of service endorsement.

The holder of a first- or second-class radiotelegraph operator license desiring an endorsement to be placed thereon attesting to an aggregate of at least 6 months' satisfactory service as a qualified operator on a vessel of the United States may, in the event documentary evidence cannot be produced, submit to any office of the Commission a statement under oath accompanied by the license to be endorsed or the application, embodying the following:

(a) Names of ships at which employed;

(b) Call letters of stations;

(c) Types of emission used;

(d) Type of service performed as follows:

(1) Manual radiotelegraph operation only; and

(2) Transmitter control only; or

(3) Combination of (1) and (2) running concurrently;

(e) Whether service was satisfactory or unsatisfactory;

(f) Period of employment;

(g) Name of master, employer, licensee, or his duly authorized agent.

PART 15—RADIO FREQUENCY DEVICES

Subpart A—General

- | Sec. | |
|------|---|
| 15.1 | Basis of this part. |
| 15.2 | Scope of this part. |
| 15.3 | General condition of operation. |
| 15.4 | General definitions. |
| 15.5 | Equipment available for inspection. |
| 15.6 | Information required by the Commission. |
| 15.7 | General requirement for restricted radiation devices. |

Subpart B—Incidental Radiation Devices

- | | |
|-------|-------------------------|
| 15.31 | Operating requirements. |
|-------|-------------------------|

Subpart C—Radio Receivers

- Sec.
 15.61 Scope of this subpart.
 15.63 Radiation interference limits.
 15.65 All-channel television broadcast reception.
 15.66 Exemption from all-channel requirements.
 15.69 Certification of receivers.
 15.70 Information to be filed with Commission.
 15.71 Identification of certificated receivers.
 15.72 Date when certification is required.
 15.75 Measurement procedure.
 15.31 Operation of radio receivers aboard a ship.
 15.82 Interference from a radio receiver.

Subpart D—Community Antenna Television Systems

- 15.161 Radiation from a community antenna television system.
 15.162 Demonstration of compliance.
 15.163 Interference from a community antenna television system.
 15.164 Responsibility for receiver generated interference.
 15.165 Measurement of field strength.

Subpart E—Low Power Communication Devices

- 15.201 Frequencies of operation.
 15.202 Radiation limitation below 1600 kc/s.
 15.203 Alternative requirement for operation on frequencies between 160 and 190 kc/s.
 15.204 Alternative requirement for operation on frequencies between 510 and 1600 kc/s.
 15.205 Operation within the frequency band 26.97–27.27 Mc/s.
 15.211 Operation above 70 Mc/s.
 15.212 Telemetering devices and wireless microphones in the band 88–108 Mc/s.
 15.213 Custom built telemetering devices.
 15.221 Class B emission prohibited.
 15.222 Interference from low power communication devices.
 15.227 Certification requirements.
 15.228 Location of certificate.
 15.229 Date when certification is required.
 15.235 Type approval.
 15.236 Identification of type approved devices.
 15.237 Changes in type approved equipment.
 15.238 Withdrawal of certificate of type approval.

AUTHORITY: The provisions of this Part 15 issued under secs. 4, 303, 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303, except as otherwise noted. Interpret or apply sec. 301, 48 Stat. 1081; 47 U.S.C. 301.

SOURCE: The provisions of this Part 15 appear at 28 F.R. 12521, Nov. 22, 1963, except as otherwise noted.

Subpart A—General**§ 15.1 Basis of this part.**

(a) Section 301 of the Communications Act of 1934, as amended, provides for the control by the Federal Government over all the channels of interstate and foreign radio communication and further provides, in part, that no person shall use or operate apparatus for the transmission of energy, communications or signals by radio when the effects of such operation extend beyond state lines or cause interference with the transmission or reception of energy, communications, or signals, of any interstate or foreign character by radio, except under and in accordance with the Communications Act and a license granted under the provisions of that act. Restricted and incidental radiation devices emit radio frequency energy on frequencies within the radio spectrum and constitute a source of harmful interference to authorized radio communication services operating upon the channels of interstate and foreign communication unless precautions are taken which will prevent the creation of any substantial amount of such interference.

(b) Sections 303(s) and 330 of the Communications Act of 1934, as amended, provide that all television broadcast receivers shipped in interstate commerce, or imported from any foreign country, for sale or resale to the public, shall comply with the provisions of this chapter for capability of adequately receiving all television broadcast channels.

§ 15.2 Scope of this part.

(a) This part contains rules that set forth the conditions under which the operation of incidental and restricted radiation devices is considered to fall outside the purview of section 301 of the Communications Act which specifies when a station license is required as a condition for lawful operation.

(b) No incidental or restricted radiation device which fails to conform to the provisions of this part, or which causes harmful interference, may be operated without a station license. Unless such devices may be operated in accordance with the provisions of some other part of this chapter (see particularly Part 95, Citizens Radio Service), persons wishing to operate such devices in a manner inconsistent with this part will be required

to first secure an amendment of the Commission's rules to establish a licensed service providing for such operation and setting forth the technical and other limitations thereof; *Provided*, That in appropriate circumstances, when such a petition for rule making has been filed, the Commission may consider, prior to final action thereon, applications for Special Temporary Authorizations to operate stations on a developmental basis where it can be shown that such temporary operation would be in aid of a final determination as to whether the proposed rule should be adopted, and that such temporary operation would otherwise be in the public interest; and *Provided further*, That the Commission will, in exceptional situations, consider individual applications for licenses to operate incidental or restricted radiation devices, not conforming to the provisions of this part, where it can be shown that the proposed operation would be in the public interest, that it is for a unique type of station or for a type of operation which is incapable of establishment as a regular service, and that the proposed operation cannot feasibly be conducted under this part.

(c) This part also contains requirements, technical specifications, and certification procedure for the all-channel reception capability of television broadcast receivers.

§ 15.3 General condition of operation.

Persons operating restricted or incidental radiation devices shall not be deemed to have any vested or recognizable right to the continued use of any given frequency, by virtue of prior registration or certification of equipment. Operation of these devices is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by other incidental or restricted radiation devices, industrial, scientific or medical equipment, or from any authorized radio service.

§ 15.4 General definitions.

(a) *Radio frequency energy*. Electromagnetic energy at any frequency in the radio spectrum between 10 kc/s and 3,000,000 Mc/s.

(b) *Harmful interference*. Any emission, radiation or induction which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs or re-

peatedly interrupts a radiocommunication service operating in accordance with this chapter.

(c) *Incidental radiation device*. A device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy.

(d) *Restricted radiation device*. A device in which the generation of radio frequency energy is intentionally incorporated into the design and in which the radio frequency energy is conducted along wires or is radiated, exclusive of transmitters which require licensing under other parts of this chapter and exclusive of devices in which the radio frequency energy is used to produce physical, chemical or biological effects in materials and which are regulated under the provisions of Part 18 of this chapter.

(e) *Community antenna television system*. A restricted radiation device designed and used for the purpose of distributing television signals by means of conducted or guided radio frequency currents to a multiplicity of receivers outside the confines of a single building.

NOTE: The television signals that are distributed are modulated radio frequency signals and may be:

(a) Broadcast signals that have been received and amplified,

(b) Broadcast signals that have been received and converted to another frequency,

(c) Any other modulated radio frequency signals fed into the system.

(f) *Low power communication device*. A low power communication device is a restricted radiation device, exclusive of those employing conducted or guided radio frequency techniques, used for the transmission of signs, signals (including control signals), writing, images and sounds or intelligence of any nature by radiation of electromagnetic energy.

Examples: Wireless microphone, phonograph oscillator, radio controlled garage door opener and radio controlled models.

(g) *Television broadcast receiver*. Apparatus designed to receive television pictures broadcast simultaneously with sound.

(h) *Noise figure of a television broadcast receiver*. The ratio of (1) the total noise power delivered by the receiver into its output termination when the noise temperature of its input termination is standard (290° K) at all fre-

quencies, to (2) the portion thereof engendered by the input termination.

NOTE: For a television broadcast receiver, portion (2) includes only that noise from the input termination which appears in the output via the principal frequency transformation and does not include spurious contributions such as those from image-frequency transformation.

(1) *Peak picture sensitivity for television broadcast receiver.* The lowest input signal which results in standard picture test output when the receiver is tuned for maximum picture output.

NOTE: Standard picture test output for symmetrical sine-wave modulation shall be 20 volts peak-to-peak between the control elements of the picture tube.

(Secs. 1, 2, 76 Stat. 150, 151; 47 U.S.C. 303(s), 330)

§ 15.5 Equipment available for inspection.

Any equipment or device subject to the provisions of this part together with any license, certificate, notice of registration or any technical data required to be kept on file by the operator of the device shall be made available for inspection by Commission representatives upon reasonable request.

§ 15.6 Information required by the Commission.

The owner or operator of any device subject to this part shall promptly furnish to the Commission or its representative such information as may be requested concerning the operation of the device, including a copy of any measurements made for the purpose of certification.

§ 15.7 General requirement for restricted radiation devices.

Unless regulated under some other subpart of this part, any apparatus which generates a radio frequency electromagnetic field functionally utilizing a small part of such field in the operation of associated apparatus not physically connected thereto and at a distance not greater than $\frac{157,000}{F(\text{kc/s})}$ feet (equivalent to $\frac{\lambda}{2\pi}$) need not be licensed provided:

(a) That such apparatus shall be operated with the minimum power possible to accomplish the desired purpose.

(b) That the best engineering principles shall be utilized in the generation of radio frequency currents so as to guard

against interference to established radio services, particularly on the fundamental and harmonic frequencies.

(c) That in any event the total electromagnetic field produced at any point a distance of $\frac{157,000}{F(\text{kc/s})}$ feet (equivalent to $\frac{\lambda}{2\pi}$) from the apparatus shall not exceed 15 microvolts per meter.

(d) That the apparatus shall conform to such engineering standards as may from time to time be promulgated by the Commission.

(e) That in the event harmful interference is caused, the operator of the apparatus shall promptly take steps to eliminate the harmful interference.

NOTE: Radio receivers, community antenna television systems, and low power communication devices are regulated elsewhere in Part 15 and are not regulated by this section.

Subpart B—Incidental Radiation Devices

§ 15.31 Operating requirements.

An incidental radiation device shall be operated so that the radio frequency energy that is radiated does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference.

Subpart C—Radio Receivers

§ 15.61 Scope of this subpart.

Radio receivers come within the scope of this subpart insofar as they are restricted radiation devices and generate and radiate radio frequency energy or are designed to receive television pictures broadcast simultaneously with sound. Typically this subpart limits oscillator radiation from superheterodyne receivers. In the case of television broadcast receivers, this subpart also limits the radiation of radio frequency energy which is generated by the sweep circuits, and requires that such receivers be capable of adequately receiving all television broadcast channels.

(Secs. 1, 2, 76 Stat. 150, 151; 47 U.S.C. 303(s), 330)

§ 15.63 Radiation interference limits.

(a) The radiation from all radio receivers that operate (tune) in the range 30 to 890 Mc/s, including frequency modulation broadcast receivers and television

broadcast receivers, manufactured after the effective date specified in § 15.72 shall not exceed the following field strength limits at a distance of 100 feet or more from the receiver:

Frequency of radiation (Mc/s)	Field strength (uv/m)
0.45 up to and including 25.....	See paragraph (b).
Over 25 up to and including 70.....	32.
Over 70 up to and including 130.....	50.
130-174.....	50-150 (linear interpolation).
174-260.....	150.
260-470.....	150-500 (linear interpolation).
470-1000.....	500 (see paragraph (c) below).

(b) Pending the development of suitable measurement techniques for measuring the actual radiation in the band 0.45 to 25 Mc/s, the interference capabilities of a receiver in this band will be determined by the measurement of radio frequency voltage between each power line and ground at the power terminals of the receiver. This requirement applies only to radio receivers intended to be connected to power lines of public utility systems. For television broadcast receivers the voltage so measured shall not exceed 100 uv at any frequency between 450 kc/s and 25 Mc/s inclusive. For all other receivers the voltage shall not exceed 100 uv at any frequency between 450 kc/s and 9 Mc/s inclusive, 1000 uv for frequencies between 10 Mc/s and 25 Mc/s and linear increase from 100 uv to 1000 uv for frequencies between 9 Mc/s and 10 Mc/s.

(c) For television broadcast receivers, the limit 500 uv/m is temporarily increased to 1000 uv/m until April 30, 1965. [28 F.R. 12520, Nov. 22, 1963, as amended at 29 F.R. 2558, Feb. 19, 1964]

§ 15.65 All-channel television broadcast reception.

(a) Except as provided in § 15.66, all television broadcast receivers manufactured after April 30, 1964, and shipped in interstate commerce or imported from any foreign country into the United States, for sale or resale to the public, shall be capable of adequately receiving all channels allocated by the Commission to the television broadcast service. A television broadcast receiver shall be considered to be capable of adequately receiving all channels if it meets the specifications in this section for noise figure and peak picture sensitivity.

(b) The noise figure of any television broadcast receiver subject to paragraph (a) of this section, for any television channel between 14 and 83 inclusive, shall not be larger than 18 db.

(c) The peak picture sensitivity of any television broadcast receiver subject to paragraph (a) of this section, averaged for all channels between 14 and 83 inclusive, shall not be more than 6 db larger than the peak picture sensitivity of that receiver averaged for all television channels between 2 and 13 inclusive. (Interpret or apply secs. 1, 2, 76 Stat. 150, 151; 47 U.S.C. 303(s), 330)

§ 15.66 Exemption from all-channel requirement.

Subject to the following conditions, television broadcast receivers manufactured on or before April 30, 1966, which are not capable of receiving all channels allocated by the Commission to television broadcasting may be shipped in interstate commerce or imported into the United States:

(a) The television receiver is in transport to a specific educational institution, for use exclusively in that institution, and in connection with an existing or planned in-school educational television instruction program; and

(b) The television receiver is permanently identified (through stenciling, etching, raised lettering or other similarly appropriate means), and the shipping carton is identified, as follows:

FOR IN-SCHOOL USE ONLY

(Interpret or apply secs. 1, 2, 76 Stat. 150, 151; 47 U.S.C. 303(s), 330)

§ 15.69 Certification of receivers.

(a) (1) No receiver manufactured after the effective dates of this subpart (see § 15.72) that operates in the range 30 to 890 Mc/s, including frequency modulation broadcast receivers and television broadcast receivers, shall be operated without a station license unless it has been certificated to demonstrate compliance with the radiation interference limits set forth in § 15.63.

(2) Except as provided in § 15.66, no television broadcast receiver manufactured after April 30, 1964, shall be shipped in interstate commerce or imported from any foreign country into the United States, for sale or resale to the public, unless it has been certificated to comply with the noise figure and peak picture sensitivity requirements set forth in § 15.65. (This provision does not apply

to carriers which transport television broadcast receivers without trading in them.)

(b) The owner or operator need not certificate his own receiver as meeting the radiation interference limits of § 15.63 if it has been certificated by the manufacturer or the distributor.

(c) Certification made by the manufacturer or the distributor shall be based on tests made on receivers actually produced for sale. Tests shall be performed on a sufficient number of production units to assure that all production units comply with the requirements of this subpart.

(d) The certificate may be executed by an engineer skilled in making and interpreting such measurements as are required.

(e) The certificate shall contain the following information:

(1) Name of the manufacturer or distributor of the receiver.

(2) Model number.

(3) Brief description of receiver, including tuning range, type of circuit, and purpose for which used (as broadcast, aircraft, etc.).

(4) Brief statement of the measurement procedure used.

NOTE: If a standard procedure is used, it is sufficient to identify the standard. Other measurement procedures must be described in detail.

(5) Date the measurements were made.

(6) A summary of the data obtained.

NOTE: For television broadcast receivers the measured noise figure and peak picture sensitivity must be stated.

(7) A statement certifying that, on the basis of measurements made, the radio receiver is capable of complying with the requirements of this part under normal operation with the usual maintenance.

(8) The name and address of the certifying engineer, and name and address of his employer, if any.

(9) Date of the certificate.

(f) The certificate shall be retained by the owner, the manufacturer, or the distributor (as may be appropriate) for a period of 5 years, and shall be made available, upon reasonable request, to an authorized Commission representative, or photostat furnished by mail. (See § 15.70 for filing requirement with FCC.)

(Secs. 1, 2, 76 Stat. 150, 151; 47 U.S.C. 303(s), 330)

§ 15.70 Information to be filed with Commission.

(a) Each manufacturer, distributor or other certifying agency that issues certifications pursuant to this subpart shall file with the Commission a description of its measurement facilities used for certification.

(b) A copy of each certificate prepared by a manufacturer, distributor or certifying agency shall be filed with the Commission at the time the certificate is prepared.

(c) This information is not open to public inspection.

§ 15.71 Identification of certificated receivers.

(a) Each certificated receiver shall be identified by a distinctive seal or label, which may be a part of the name plate and which shall state that the receiver has been certificated for compliance with the requirements of this subpart. The seal or label shall be permanently attached to the receiver and shall be readily visible for inspection by prospective purchasers.

(b) After January 1, 1964, cartons containing television broadcast receivers shipped in interstate commerce or imported into the United States, for sale or resale to the public, shall clearly indicate either (1) that the receiver within was manufactured on or before April 30, 1964, or (2) that the receiver within meets all FCC requirements pertaining to all-channel reception (see § 15.65).

(c) For identification of receivers exempted from the all-channel requirement, see § 15.66.

(Interpret or apply secs. 1, 2, 76 Stat. 150, 151; 47 U.S.C. 303(s), 330)

§ 15.72 Date when certification is required.

(a) *For television broadcast receivers.*

(1) VHF television broadcast receivers manufactured after May 1, 1956, shall comply with the certification requirements with respect to radiation of radio frequency energy, except that compliance with the power line interference limits for frequencies between 3 Mc/s and 25 Mc/s is required for such receivers manufactured after December 31, 1957.

(2) UHF television broadcast receivers manufactured after December 31, 1957, shall comply with the certification requirements with respect to radiation of radio frequency energy.

(3) Except as provided in § 15.66, all television broadcast receivers manufactured after April 30, 1964, shall comply with the certification requirement with respect to adequacy of all-channel reception.

(b) *For other receivers.* All radio receivers other than television broadcast receivers that operate (tune) in the range 30 to 890 Mc/s manufactured after October 1, 1956, shall comply with the certification requirements with respect to radiation of radio frequency energy, except as follows:

(1) FM broadcast receivers manufactured after December 31, 1956, shall comply with the certification requirements with respect to frequencies above 25 Mc/s. All such receivers manufactured after December 31, 1957, shall comply with the certification requirements with respect to all frequencies.

(2) The radiation interference limits and the certification requirement with respect thereto shall be met by all pocket type super-regenerative receivers used in the one-way signalling services as defined in Part 21 of this chapter which are manufactured after December 31, 1956.

(Interpret or apply secs. 1, 2, 76 Stat. 150, 151; 47 U.S.C. 303(s), 330) [28 F.R. 12521, Nov. 22, 1963, as amended at 29 F.R. 2558, Feb. 19, 1964]

§ 15.75 Measurement procedure.

(a) Any measurement procedure acceptable to the Commission may be used to show compliance with the requirements of this subpart. A detailed description of the proposed measurement procedure, including a list of the test equipment to be used, shall be submitted to the Commission when requesting a determination regarding the acceptability of the proposed measurement procedure.

(b) The following methods of measurement are considered acceptable procedures for certification of receivers pursuant to § 15.69:

(1) Institute of Radio Engineers Standard 51 IRE 17S1 for radiation measurements.

(2) Institute of Radio Engineers Standard 61 IRE 27S1 for conducted interference measurements from frequency modulated and television broadcast receivers in the range of 300 kc/s to 25 Mc/s.

(3) Institute of Radio Engineers standard 60 IRE 17 S1 for measurement

of noise figure and peak picture sensitivity of a television broadcast receiver.

(c) In the case of measurements in the field, radiation in excess of 15 uv/m at any frequency between 450 kc/s and 25 Mc/s at the border of the property and more than 15 feet from any power line crossing this border under the control and exclusive use of the person operating or authorizing the operation of the receiver will be considered an indication of noncompliance with the radiation requirements of this subpart.

§ 15.81 Operation of radio receivers aboard a ship.

In addition to meeting the requirements of this part, a radio receiver operated aboard a ship shall also meet the requirements of Part 83 of this chapter.

§ 15.82 Interference from a radio receiver.

The operator of a radio receiver, regardless of tuning range, date of manufacture, or of certification, which causes harmful interference shall promptly take steps to eliminate the harmful interference.

Subpart D—Community Antenna Television Systems

§ 15.161 Radiation from a community antenna television system.

Radiation from a community antenna television system shall be limited as follows:

Frequencies (Mc/s)	Distance (ft.)	Radiation limits (uv/m)	
		General requirement	Sparsely inhabited areas ¹
Up to and including 54.....	100	15	15
Over 54 up to and including 132.....	10	20	400
Over 132 up to and including 216.....	10	50	1,000
Over 216.....	100	15	15

¹ For the purpose of this section, a sparsely inhabited area is that area within 1,000 feet of a community antenna television system where television broadcast signals are, in fact, not being received directly from a television broadcast station.

§ 15.162 Demonstration of compliance.

The operator of each CATV system shall be responsible for insuring that each such system is designed, installed and operated in a manner which fully

complies with the provisions of this subpart. Each system operator shall be prepared to show, upon reasonable demand by an authorized representative of the Commission, that the system does, in fact, comply with the rules.

§ 15.163 Interference from a community antenna television system.

In the event that the operation of a community antenna television system causes harmful interference to reception of authorized radio stations the operator of the system shall immediately take whatever steps are necessary to remedy the interference.

§ 15.164 Responsibility for receiver generated interference.

Interference originating in a radio receiver shall be the responsibility of the receiver operator in accordance with the provisions of Subpart C of this part: *Provided, however,* That the operator of the community antenna television system to which the receiver is connected shall be responsible for the suppression of receiver generated interference that is distributed by the system when this interference is conducted into the system at the receiver.

§ 15.165 Measurement of field strength.

Measurements to determine the field strength of radio frequency energy generated by community antenna television systems shall be made in accordance with standard engineering procedures. Measurements made above 25 Mc/s shall include the following:

(a) A field strength meter using a horizontal dipole antenna shall be employed.

(b) Field strength shall be expressed in terms of the RMS value of synchronizing peak.

(c) The dipole antenna shall be placed 12 feet above the ground and positioned directly below the system components. Where such placement results in a separation of less than 10 feet between the center of the dipole antenna and the system components, the dipole shall be repositioned to provide a separation of 10 feet.

(d) The horizontal dipole antenna shall be rotated about a vertical axis and the maximum meter reading shall be used.

(e) Measurements shall be made where other conductors are 10 or more feet away from the measuring antenna.

Subpart E—Low Power Communication Devices

§ 15.201 Frequencies of operation.

(a) A low power communication device may be operated on any frequency in the bands 10–490 kc/s, 510–1600 kc/s, and 26.97–27.27 Mc/s.

(b) Other frequencies above 70 Mc/s may be used for operations of short duration in accordance with the requirements set forth in § 15.211.

(c) Telemetering devices and wireless microphones may be operated in the band 88–108 Mc/s in accordance with the provisions of § 15.212.

§ 15.202 Radiation limitation below 1600 kc/s.

A low power communication device which operates on any frequency between 10 and 490 kc/s or between 510 and 1600 kc/s shall limit the radiation so that the field strength does not exceed the value specified in the following table:

Frequency (kc/s)	Distance (feet)	Field strength (uv/m)
10–490.....	1,000	$\frac{2400}{F(kc/s)}$
510–1600.....	100	$\frac{24000}{F(kc/s)}$

§ 15.203 Alternative requirement for operation on frequencies between 160 and 190 kc/s.

In lieu of meeting the radiation limitation, stated in § 15.202, a low power communication device operating on a frequency between 160 and 190 kc/s need only meet the following requirements:

(a) The power input to the final radio frequency stage (exclusive of filament or heater power) does not exceed one watt.

(b) All emissions below 160 kc/s or above 190 kc/s are suppressed 20 db or more below the unmodulated carrier.

(c) The total length of the transmission line plus the antenna does not exceed 50 feet.

§ 15.204 Alternative requirement for operation on frequencies between 510 and 1600 kc/s.

In lieu of meeting the radiation limitation stated in § 15.202, a low power communication device operating

on a frequency between 510 and 1600 kc/s inclusive need only meet the following requirements:

(a) The power input to the final radio stage (exclusive of filament or heater power) does not exceed 100 milliwatts.

(b) The emissions below 510 kc/s or above 1600 kc/s are suppressed 20 db or more below the unmodulated carrier.

(c) The total length of the transmission line plus the antenna does not exceed 10 feet.

(d) Low power communication devices obtaining their power from the lines of public utility systems shall limit the radio frequency voltage appearing on each power line to 200 microvolts or less on any frequency from 510 kc/s to 1600 kc/s. Measurements shall be made from each power line to ground both with the equipment grounded and with the equipment ungrounded.

NOTE: One method of determining radio frequency voltage on the power line is described in "Military Specification for Interference Measurement" MIL-I-16910 (SHIPS) dated January 14, 1952, available from the Commanding Officer, Naval Supply Depot, Scotia, New York, 12302. Note that this procedure calls for grounding the equipment under test, whereas the Commission's rules call for measurements both with the equipment grounded and with the equipment ungrounded.

§ 15.205 Operation within the frequency band 26.97–27.27 Mc/s.

A low power communication device may operate within the band 26.97–27.27 Mc/s (27.12 Mc/s \pm 150 kc/s) provided it complies with all of the following requirements:

(a) The carrier of the device shall be maintained within the band 26.97–27.27 Mc/s.

(b) All emissions, including modulation products, below 26.97 Mc/s or above 27.27 Mc/s shall be suppressed 20 db or more below the unmodulated carrier.

(c) The power input to the final radio stage (exclusive of filament or heater power) shall not exceed 100 milliwatts.

(d) The antenna shall consist of a single element that does not exceed 5 feet in length.

§ 15.211 Operation above 70 Mc/s.

Except for telemetering devices and wireless microphones operated in accordance with the requirements of § 15.212 and § 15.213, a low power communication device, manufactured on or after July 15,

1963, may be operated on any frequency above 70 Mc/s, provided it complies with all of the following conditions:

(1) The radiated field on any frequency from 70 Mc/s up to and including 1000 Mc/s does not exceed the limits specified for receivers in § 15.63.

(2) The radiated field on any frequency above 1000 Mc/s does not exceed 500 microvolts per meter at a distance of 100 feet.

(3) The device is provided with means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall not be less than 30 seconds.

(4) The device shall be so constructed that there are no external or readily accessible controls which may be adjusted to permit operation in a manner inconsistent with the provisions of this paragraph.

(b) Except for telemetering devices and wireless microphones operated in accordance with the requirements of § 15.212 and § 15.213, a low power communication device, manufactured before July 15, 1963, may be operated on any frequency above 70 Mc/s, provided it complies with all of the following conditions:

(1) The radiated field on any frequency from 70 Mc/s up to and including 1000 Mc/s does not exceed the limits specified for receivers in § 15.63.

(2) The radiated field on any frequency above 1000 Mc/s does not exceed 500 microvolts per meter at a distance of 100 feet.

(3) The device is provided with means for automatically limiting operation to a duration of not more than one second, not to occur more than once in 30 seconds.

§ 15.212 Telemetering devices and wireless microphones in the band 88–108 Mc/s.

(a) Operation in the band 88–108 Mc/s is limited to low power communication devices employed as telemetering devices or as wireless microphones. This band shall not be used for two way communication.

(b) Users of these devices shall take adequate precautions to insure that harmful interference is not caused to the reception of transmissions from any FM or television broadcast station or any other class of station licensed by the

Commission. In the event that such interference does occur, operation of the telemetering device or wireless microphone shall be promptly suspended and shall not be resumed until the interference has been eliminated. Users of these devices must accept any interference which may be caused by the operation of any licensed station operating in accordance with the terms of its license.

(c) Emissions from the device shall be confined within a band 200 kc/s wide centered on the operating frequency. Such 200 kc/s band shall lie wholly within the frequency range 88–108 Mc/s.

(d) The field strength of emissions radiated within the specified 200 kc/s band shall not exceed 50 uv/m at a distance of 50 feet or more from the device.

(e) The field strength of emissions radiated on any frequency outside the specified 200 kc/s band shall not exceed 40 uv/m at a distance of 10 feet or more from the device.

(f) Except as provided in § 15.213, no such device shall be operated unless it has been type approved pursuant to § 15.235.

(g) No antenna other than that furnished by the manufacturer shall be used with any type approved device.

§ 15.213 Custom built telemetering devices.

Custom built telemetering devices used for experimentation by an educational institution need not be type approved, *Provided:*

(a) The device complies with the technical requirements of § 15.212;

(b) The device has been certificated pursuant to §§ 15.227 and 15.228; and

(c) The educational institution notifies the Engineer-in-Charge of the local FCC office, in writing, in advance of operation. The notice shall include:

(1) The dates and place where the device will be operated;

(2) The purpose for which the device will be used;

(3) A description of the device including the operating frequency, RF power output, and antenna; and

(4) A statement certifying that the device complies with the technical provisions of § 15.212.

§ 15.221 Class B emission prohibited.

Operation of low power communication devices that produce Class B emissions (damped waves) is prohibited.

§ 15.222 Interference from low power communication devices.

Notwithstanding the other requirements of this part, the operator of a low power communication device, regardless of date of manufacture, which causes harmful interference to an authorized radio service, shall promptly stop operating the device until the harmful interference has been eliminated.

§ 15.227 Certification requirements.

(a) Except for telemetering devices and wireless microphones which have been type approved pursuant to § 15.235, no low power communication device manufactured after the dates set forth in § 15.229 shall be operated without a station license unless it has been certificated to demonstrate compliance with the requirements in this part.

(b) The owner or operator need not certificate his own low power communication device, if it has been certificated by the manufacturer or distributor.

(c) Where certification is based on measurement of a prototype, a sufficient number of units shall be tested to assure that all production units comply with the technical requirements of this subpart.

(d) The certificate may be executed by a technician skilled in making and interpreting the measurements that are required to assure compliance with the requirements of this part.

(e) The certificate shall contain the following information:

(1) The operating conditions under which the device is intended to be used.

(2) The antenna to be used with the device.

(3) A statement certifying that the device can be expected to comply with the requirements of this subpart under the operating conditions specified in the certificate.

(4) The month and year in which the device was manufactured.

§ 15.228 Location of certificate.

The certificate shall be permanently attached to the device and shall be readily visible for inspection.

§ 15.229 Date when certification is required.

All low power communication devices which operate on frequencies of 70 Mc/s or above, manufactured after June 30, 1958, shall comply with the type approval

or certification requirements of this subpart. All low power communication devices which operate on frequencies below 70 Mc/s, manufactured after December 31, 1957, shall comply with the certification requirements of this subpart.

§ 15.235 Type approval.

(a) A manufacturer of a telemetering device or wireless microphone who desires to obtain type approval for his equipment may request permission to submit such equipment to the Commission for testing by following the procedure set out in Subpart F of Part 2 of this chapter, as modified by this section. The manufacturer shall furnish the following with his request for type approval:

(1) A report of measurements showing that the equipment is capable of complying with the requirements of § 15.212;

(2) A statement that at least 10 units are proposed to be manufactured; and

(3) A statement agreeing to include a reprint of Subparts A and E of this Part 15, current as of date of manufacture, with each unit offered for sale or resale to the public.

(b) To receive type approval, telemetering devices and wireless microphones must meet the following requirements:

(1) The device must comply with the technical limitations of § 15.212.

(2) The design and construction of the equipment must give reasonable assurance of compliance with the requirements of § 15.212 for at least five years under normal operation and with average maintenance.

(3) The device must be so constructed that the adjustment of any control accessible to the user shall not cause operation in violation of § 15.212.

§ 15.236 Identification of type approved devices.

The Commission will assign a type approval number to each telemetering device or wireless microphone which is type approved. The type approval number and the following statement shall be permanently inscribed upon or permanently attached to each production unit as follows:

FCC Type Approval No. -----

Valid only when operated pursuant to FCC Rules, Part 15, and when used with antenna furnished by manufacturer.

§ 15.237 Changes in type approved equipment.

No changes whatsoever may be made in a type approved telemetering device or wireless microphone, including the antenna, except on specific prior approval by the Commission.

§ 15.238 Withdrawal of certificate of type approval.

(a) A certificate of type approval may be withdrawn if the type of equipment for which it was issued proves defective in service and under usual conditions of maintenance and operation such equipment cannot be relied on to meet the conditions set forth in this part for the operation of the type of equipment involved, or if any change whatsoever is made in the construction of equipment sold under the certificate of type approval issued by the Commission, without the specific prior approval of the Commission.

(b) The procedure for withdrawal of the certificate of type approval shall be the same as that prescribed for revocation of a radio station license pursuant to the provisions of the Communications Act of 1934, as amended.

(c) In the case of withdrawal of a certificate of type approval, the manufacturer shall make no further sale of equipment under such certificate.

(d) When a certificate of type approval has been withdrawn for unauthorized changes or for failure to comply with technical requirements, the Commission will consider that fact in determining whether the manufacturer in question is eligible to receive any new certificate of type approval.

PART 17—CONSTRUCTION, MARKING, AND LIGHTING OF ANTENNA STRUCTURES

Subpart A—General Information

- | | |
|------|---|
| Sec. | |
| 17.1 | Basis and purpose. |
| 17.2 | Definitions. |
| 17.3 | Form to be used to describe proposed antenna structures. |
| 17.4 | Commission consideration of proposed antenna structure with respect to possible hazard to air navigation. |

Subpart B—Criteria for Determining Whether Applications for Radio Towers Require Notification of Proposed Construction to Federal Aviation Agency

- | | |
|-------|---|
| 17.11 | Antenna structures over 500 feet in height. |
|-------|---|