

**FEDERAL COMMUNICATIONS  
COMMISSION**

**47 CFR Parts 1, 2, 21, 94, and 101**

[WT Docket No. 94-148, FCC 96-51]

**Terrestrial Microwave Fixed Radio  
Services**

**AGENCY:** Federal Communications  
Commission.

**ACTION:** Final rule.

**SUMMARY:** The Commission has adopted a Report and Order to establish regulations governing the Terrestrial Microwave Fixed Radio Services and implement section 403(j) of the Telecommunications Act of 1996. These amendments streamline the Commission's rules, expedite processing of authorizations for the Terrestrial Microwave Fixed Radio Services, and clarify rules concerning the Terrestrial Microwave Fixed Radio Services.

**EFFECTIVE DATE:** These regulations are effective August 1, 1996.

**FOR FURTHER INFORMATION CONTACT:**  
Robert James of the Wireless  
Telecommunications Bureau at (202)  
418-0680.

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's Report and Order, adopted February 8, 1996, and released February 29, 1996. The full text of this action is available for inspection and copying during normal business hours in the FCC Reference Center, Room 239, 1919 M Street, NW., Washington, DC. The complete text may be purchased from the Commission's copy contractor, ITS, Inc., (202) 857-3800, 2100 M Street, NW., Suite 140, Washington, DC 20037.

Summary of Report and Order

1. In this action, the Commission created one comprehensive new rule part for the microwave services and eliminated undue regulatory burdens resulting in significant benefits for both the public and the Commission. We reorganized and amended parts 21 and 94 of the rules to establish a new part 101. We anticipate that the new consolidated part 101 will result in a number of major benefits. First, the public will benefit from simplified and streamlined rules. Second, both the public and the Commission will benefit from reduced regulatory burdens. Third, the new rules will encourage more efficient use of microwave spectrum by permitting more intensive use of microwave equipment. Fourth, common technical standards for common carrier and private operational fixed microwave equipment will lead to economics of

scale in microwave equipment production and lower equipment prices to licensees. The new consolidated part 101 will eliminate arbitrary distinction and further regulatory symmetry between common carrier and private operational fixed microwave services.

2. Section 403(j) of the 1996 Telecommunications Act amends section 309(b) of the Communications Act by removing the requirement that the Commission delay granting an application for a private fixed point-to-point microwave station until thirty days after the Commission issues a public notice announcing that it has accepted the application for filing. This Report and Order deletes § 1.962(a) of its rules, 47 CFR 1.962(a), to reflect this statutory change.

3. These new rules reflect a comprehensive restructuring in the regulatory requirements and policies of the fixed microwave services. The streamlined and simplified rules, reduce regulatory burdens, encourage more efficient use of the microwave spectrum, and foster economies of scale in microwave equipment production. These rules will allow licensees to compete more on price and quality of service rather than on regulatory gamesmanship.

4. The rules are set forth below.

5. This Report and Order is issued under the authority of sections 4(i) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i) and 303(r).

6. Need and purpose of this action. This Report and Order simplifies the rules for the common carrier and private operational fixed services, currently contained respectively in parts 21 and 94 of the Commission's rules, and consolidates those rules into a new part 101. These new rules eliminate unnecessary information collection requirements, eliminate redundancy, remove obsolete language, and promote the public interest.

7. Summary of issues raised by the public. Several commenters suggested modifications to some of the Commission's proposals. As a result of these comments, we have made modifications to the proposed rules as appropriate. The specific suggestions and modifications are discussed in the paragraphs above.

8. Significant alternatives considered. The Notices of Proposed Rule Making in the two subject proceedings offered numerous proposals. The commenters overwhelmingly supported the majority of the proposed rule changes. Several commenters suggested modifications to some of the Commission's proposals. Many of the suggested modifications are

incorporated in the final rules. The regulatory burdens which we have retained are necessary to fulfill our duties under the Communications Act of 1934, as amended. We will continue to examine alternatives in the future with the objective of eliminating unnecessary regulations and minimizing economic impact on small business entities.

List of Subjects

*47 CFR Part 1*

Administrative practice and procedure.

*47 CFR Part 2*

Communications equipment.

*47 CFR Part 21*

Communications equipment, Radio, Reporting and recordkeeping requirements.

*47 CFR Part 94*

Communications equipment, Radio, Reporting and recordkeeping requirements.

*47 CFR Part 101*

Communications equipment, Radio, Reporting and recordkeeping requirements.

Federal Communications Commission.

William F. Caton,

*Acting Secretary.*

Final Rules

Parts 1, 2, 21 and 94 of Chapter I of Title 47 of the Code of Federal Regulations are amended as follows:

**PART 1—PRACTICE AND  
PROCEDURE**

1. The authority citation for part 1 continues to read as follows:

Authority: 47 U.S.C. 151, 154, 303, and 303(j) unless otherwise noted.

2. Section 1.77 is amended by adding a new paragraph (i) to read as follows:

**§ 1.77 Detailed application procedures;  
cross references.**

\* \* \* \* \*

(i) Rules governing applications for authorizations in the Common Carrier and Private Radio terrestrial microwave services are set out in part 101 of this chapter.

3. Section 1.741 is revised to read as follows:

**§ 1.741 Scope.**

The general rules relating to applications contained in §§ 1.742 through 1.748 apply to all applications filed by carriers except those filed by public correspondence radio stations

pursuant to parts 80, 87, and 101 of this chapter, and those filed by common carriers pursuant to part 25 of this chapter. Parts 21 and 101 of this chapter contain general rules applicable to applications filed pursuant to these parts. For general rules applicable to applications filed pursuant to parts 80 and 87 of this chapter, see such parts and subpart F of this part. For rules applicable to applications filed pursuant to part 25, see said part.

4. Section 1.761 is revised to read as follows:

**§ 1.761 Cross reference.**

Specific types of applications under Title III of the Communications Act involving public correspondence radio stations are specified in parts 23, 80, 87, and 101 of this chapter.

5. Section 1.825 is amended by revising paragraph (b) to read as follows:

**§ 1.825 Random selection procedures for Digital Electronic Message Service.**

(b) Petitions to deny applications for digital electronic message service authorizations, and responsive pleadings, shall be filed prior to conducting the random selection, pursuant to the requirements of § 101.43 of this chapter. Following the random selection, petitions against tentative selectee's applications shall be resolved by the Commission.

6. Section 1.901 is revised to read as follows:

**§ 1.901 Scope.**

In the case of any conflict between the rules set forth in this subpart and the rules set forth in part 13 of this chapter or the rules set forth for specific services in parts 80 through 101 of this chapter, the rules in this subpart shall govern.

7. Section 1.924 is amended by revising paragraph (b)(2)(ii) to read as follows:

**§ 1.924 Assignment or transfer of control, voluntary and involuntary.**

(b)(1) \* \* \*  
 (2) \* \* \*  
 (ii) *FCC Form 402*. For assignment of station authorizations in the Private Operational Fixed Microwave Service (part 101 of this chapter). Attached thereto shall be an executed Form 1046 or a signed letter from proposed assignor stating the assignor's desire to assign the current authorization in accordance with the rules governing the particular service involved.

8. Section 1.926 is amended by revising paragraph (a)(6) to read as follows:

**§ 1.926 Application for renewal of license.**

(a) \* \* \*  
 (6) Renewal of station authorizations in the Private Operational Fixed Microwave Service (part 101 of this chapter) shall be submitted on such form as the Commission may designate by the public notice in accordance with the provisions of § 101.13 of this chapter.

**§ 1.962 [Amended]**

9. Section 1.962 is amended by removing paragraph (a)(1) and redesignating paragraphs (a)(2) through paragraphs (a)(7) as paragraphs (a)(1) through (a)(6) respectively.

10. Section 1.972 is amended by revising paragraphs (a)(1) and (c) to read as follows:

**§ 1.972 Grants by random selection.**

(a) \* \* \*  
 (1) For stations in the following Private Radio Services:

- Part 80—Stations in the Maritime Services
- Part 87—Aviation Services
- Part 90—Private Land Mobile Services
- Part 95—Subpart F—Personal Radio Services
- Part 101—Subpart H—Private Operational Fixed Point-to-Point Microwave Service.

(c) If there are mutually exclusive applications for an initial license for stations subject to part 80 or part 87 of this chapter, or if there are more applications for an initial license in part 90, part 95-subpart F, or part 101-subpart H of this chapter, than can be accommodated on available frequencies, the Commission may process the applications pursuant to a system of random selection. Each such random selection shall be conducted pursuant to an order issued by the Wireless Telecommunications Bureau and under the direction of the Chief of the Bureau.

**PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS**

1. The authority citation for part 2 continues to read as follows:

Authority: Sec. 4, 302, 303, and 307 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154, 302, 303, and 307, unless otherwise noted.

2. Section 2.995 is amended by revising paragraph (a)(2) to read as follows:

**§ 2.995 Measurements required: Frequency stability.**

(a) \* \* \*  
 (2) From  $-20^{\circ}$  to  $+50^{\circ}$  centigrade for equipment to be licensed for use in the

Maritime Services under part 80 of this chapter, except Class A, B, and S Emergency Position Indicating Radiobeacons (EPIRBS), and equipment to be licensed for use above 952 MHz at operational fixed stations in all services, stations in the Local Television Transmission Service and Point-to-Point Microwave Radio Service under part 101 of this chapter, and equipment licensed for use aboard aircraft in the Aviation Services under part 87 of this chapter.

**PART 21—DOMESTIC PUBLIC FIXED RADIO SERVICES**

1. The authority citation for part 21 continues to read as follows:

Authority: Secs. 1, 2, 4, 201–205, 208, 215, 218, 303, 307, 313, 314, 403, 404, 410, 602; 48 Stat. as amended, 1064, 1066, 1070–1073, 1076, 1077, 1080, 1082, 1083, 1087, 1094, 1098, 1102; 47 U.S.C. 151, 154, 201–205, 208, 215, 218, 303, 307, 313, 314, 403, 404, 602; 47 U.S.C. 552, 554.

2. Section 21.2 is revised to read as follows:

**§ 21.2 Definitions.**

As used in this part:  
*Antenna power gain.* The square of the ratio of the root-mean-square free space field intensity produced at one mile in the horizontal plane, in millivolts per meter for one kilowatt antenna input power to 137.6 mV/m. This ratio should be expressed in decibels (dB). (If specified for a particular direction, antenna power gain is based on the field strength in that direction only.)

*Antenna power input.* The radio frequency peak or RMS power, as the case may be, supplied to the antenna from the antenna transmission line and its associated impedance matching network.

*Antenna structures.* The antenna, its supporting structure and anything attached to it.

*Assigned frequency.* The centre of the frequency band assigned to a station.

*Authorized bandwidth.* The maximum width of the band of frequencies permitted to be used by a station. This is normally considered to be the necessary or occupied bandwidth, whichever is greater.

*Authorized frequency.* The frequency, or frequency range, assigned to a station by the Commission and specified in the instrument of authorization.

*Authorized power.* The maximum power a station is permitted to use. This power is specified by the Commission in the station's authorization.

*Bandwidth occupied by an emission.* The band of frequencies comprising 99

percent of the total radiated power extended to include any discrete frequency on which the power is at least 0.25 percent of the total radiated power.

**Basic Trading Area (BTA).** The geographic areas by which the Multipoint Distribution Service is licensed. BTA boundaries are based on the Rand McNally 1992 Commercial Atlas and Marketing Guide, 123rd Edition, pp. 36–39, and include six additional BTA-like areas as specified in § 21.924(b).

**Bit rate.** The rate of transmission of information in binary (two state) form in bits per unit time.

**BTA authorization holder.** The individual or entity authorized by the Commission to provide Multipoint Distribution Service to the population of a BTA.

**BTA service area.** The area within the boundaries of a BTA to which a BTA authorization holder may provide Multipoint Distribution Service. This area excludes the protected service areas of incumbent MDS stations and previously proposed and authorized ITFS facilities, including registered receive sites.

**Carrier.** In a frequency stabilized system, the sinusoidal component of a modulated wave whose frequency is independent of the modulating wave; or the output of a transmitter when the modulating wave is made zero; or a wave generated at a point in the transmitting system and subsequently modulated by the signal; or a wave generated locally at the receiving terminal which when combined with the side bands in a suitable detector, produces the modulating wave.

**Carrier frequency.** The output of a transmitter when the modulating wave is made zero.

**Communication common carrier.** Any person engaged in rendering communication service for hire to the public.

**Control point.** A control point is an operating position at which an operator responsible for the operation of the transmitter is stationed and which is under the control and supervision of the licensee.

**Control station.** A fixed station whose transmissions are used to control automatically the emissions or operations of another radio station at a specified location, or to transmit automatically to an alarm center telemetering information relative to the operation of such station.

**Coordination distance.** For the purpose of this part, the expression "coordination distance" means the distance from an earth station, within which there is a possibility of the use of

a given transmitting frequency at this earth station causing harmful interference to stations in the fixed or mobile service, sharing the same band, or of the use of a given frequency for reception at this earth station receiving harmful interference from such stations in the fixed or mobile service.

**Digital modulation.** The process by which some characteristic (frequency, phase, amplitude or combinations thereof) of a carrier frequency is varied in accordance with a digital signal, e.g. one consisting of coded pulses or states.

**Domestic fixed public service.** A fixed service, the stations of which are open to public correspondence, for radiocommunications originating and terminating solely at points all of which lie within:

- (a) The State of Alaska;
- (b) The State of Hawaii;
- (c) The contiguous 48 States and the District of Columbia; or
- (d) A single possession of the United States. Generally, in cases where service is afforded on frequencies above 72 MHz, radio-communications between the contiguous 48 States (including the District of Columbia) and Canada or Mexico, or radiocommunications between the State of Alaska and Canada, are deemed to be in the domestic fixed public service.

**Domestic public radio services.** The land mobile and domestic fixed public services the stations which are open to public correspondence.

Note: Part 80 of this chapter is applicable to the maritime services and fixed stations associated with the maritime services; part 87 of this chapter is applicable to aeronautical services.

**Earth station.** A station located either on the earth's surface or within the major portion of the earth's atmosphere and intended for communications:

- (a) With one or more space stations; or
- (b) With one or more stations of the same kind by means of one or more reflecting satellites or other objects in space.

**Effective radiated power (ERP).** The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction.

**Equivalent Isotropically Radiated Power (EIRP).** The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna. This product may be expressed in watts or dB above 1 watt (dBW).

**Facsimile.** A form of telegraphy for the transmission of fixed images, with or without half-tones, with a view to their reproduction in a permanent form.

**Fixed earth station.** An earth station intended to be used at a specified fixed point.

**Fixed station.** A station in the fixed service.

**Frequency tolerance.** The maximum permissible departure by the centre frequency of the frequency band occupied by an emission from the assigned frequency or, by the characteristic frequency of an emission from the reference frequency. The frequency tolerance is expressed as a percentage or in Hertz.

**Harmful interference.** Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service.

**Incumbent.** An MDS station that was authorized or proposed before September 15, 1995, including those stations that are subsequently modified, renewed or reinstated.

**Landing area.** A landing area means any locality, either of land or water, including airports and intermediate landing fields, which is used, or approved for use for the landing and take-off of aircraft, whether or not facilities are provided for the shelter, servicing, or repair of aircraft, or for receiving or discharging passengers or cargo.

**Microwave frequencies.** As used in this part, this term refers to frequencies of 890 MHz and above.

**Multichannel multipoint distribution service.** Those multipoint distribution service channels that use the frequency band 2596 MHz to 2644 MHz and associated response channels.

**Multipoint distribution service.** A one-way domestic public radio service rendered on microwave frequencies from a fixed station transmitting (usually in an omnidirectional pattern) to multiple receiving facilities located at fixed points.

**Multipoint distribution service response station.** A fixed station operated at an MDS receive location to provide communications with the associated station in the Multipoint Distribution Service.

**Necessary bandwidth of emission.** For a given class of emission, the width of the frequency band that is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.

Note: The necessary bandwidth for an emission may be calculated using the formulas in § 2.202 of this chapter.

**Partitioned service area authorization holder.** The individual or entity authorized by the Commission to

provide Multipoint Distribution Service to the population of a partitioned service area.

*Partitioned service area (PSA).* The area within the coterminous boundaries of one or more counties or other geopolitical subdivisions, drawn from a BTA, to which an authorization holder may provide Multipoint Distribution Service or the area remaining in a BTA upon partitioning any portion of that BTA. This area excludes the protected service areas of incumbent MDS stations and previously proposed and authorized ITFS stations, including registered receive sites.

*Private line service.* A service whereby facilities for communication between two or more designated points are set aside for the exclusive use or availability for use of a particular customer and authorized users during stated periods of time.

*Public correspondence.* Any telecommunication which the offices and stations, by reason of their being at the disposal of the public, must accept for transmission.

*Radio station.* A separate transmitter or a group of transmitters under simultaneous common control, including the accessory equipment required for carrying on a radiocommunication service.

*Radiocommunication.* Telecommunication by means of radio waves.

*Rated power output.* The term "rated power output" of a transmitter means the normal radio frequency power output capability (Peak or Average Power) of a transmitter, under optimum conditions of adjustment and operation, specified by its manufacturer.

*Record communication.* Any transmission of intelligence which is reduced to visual record form at the point of reception.

*Reference frequency.* A frequency having a fixed and specified position with respect to the assigned frequency. The displacement of this frequency with respect to the assigned frequency has the same absolute value and sign that the displacement of the characteristic frequency has with respect to the center of the frequency band occupied by the emission.

*Relay station.* A fixed station used for the reception and retransmission of the signals of another station or stations.

*Repeater station.* A fixed station established for the automatic retransmission of radiocommunications received from one or more stations and directed to a specified receiver site.

*Signal booster station.* A low-power repeater station automatically retransmitting on the same frequency as

the received signal, and located within the protected service area of a Multipoint Distribution Service station.

*Standby transmitter.* A transmitter installed and maintained for use in lieu of the main transmitter only during periods when the main transmitter is out of service for maintenance or repair.

*Symbol rate.* Modulation rate in bauds. This rate may be higher than the transmitted bit rate as in the case of coded pulses or lower as in the case of multilevel transmission.

*Television.* A form of telecommunication for transmission of transient images of fixed or moving objects.

*Television STL station (studio transmitter link).* A fixed station used for the transmission of television program material and related communications from a studio to the transmitter of a television broadcast station.

**§ 21.3 [Amended]**

3. Section 21.3 is amended by removing paragraph (b), and redesignating paragraph (c) as paragraph (b).

4. Section 21.6 is amended by revising paragraphs (b) and (c) to read as follows:

**§ 21.6 Filing of applications, fees, and numbers of copies.**

\* \* \* \* \*

(b) Applications requiring fees as set forth in part 1, subpart G of this chapter must be filed in accordance with § 0.401(b) of this chapter. Applications not requiring fees shall be submitted to: Federal Communications Commission, Washington, DC 20554.

(c) All correspondence or amendments concerning a submitted application shall clearly identify the radio service, the name of the applicant, station location, and the Commission file number (if known) or station call sign of the application involved. All correspondence or amendments concerning a submitted application may be sent directly to the Mass Media Bureau.

\* \* \* \* \*

5. Section 21.13 is amended by removing paragraph (f), redesignating paragraph (g) as paragraph (f), and revising paragraphs (a)(6) and (b) to read as follows:

**§ 21.13 General application requirements.**

(a) \* \* \*

(6) Show compliance with the special requirements applicable to each radio service and make all special showings that may be applicable (e.g., those required by secs. 21.900, 21.912 and 21.913).

(b) Applications filed in the Multipoint Distribution Service shall not cross-reference previously filed material.

\* \* \* \* \*

6. Section 21.15 is amended by revising the introductory text, and paragraphs (c), (d), and (g) to read as follows:

**§ 21.15 Technical content of applications.**

Applications shall contain all technical information required by the application form and any additional information necessary to fully describe the proposed facilities and to demonstrate compliance with all technical requirements of the rules governing the radio service involved (see subparts C, F and K as appropriate). The following paragraphs describe a number of technical requirements.

\* \* \* \* \*

(c) Each application involving a new or modified transmitting antenna supporting structure, passive facility, or the addition or removal of a transmitting antenna, or the repositioning of an authorized antenna for a station must be accompanied by a vertical profile sketch of the total structure depicting its structural nature and clearly indicating the ground elevation (above sea level) at the structure site, the overall height of the structure above ground (including obstruction lights when required, lightning rods, etc.) and, if mounted on a building, its overall height above the building. The proposed antenna on the structure must be clearly identified and its height above-ground (measured to the center of radiation) clearly indicated. Alternatively, applicants in the Multipoint Distribution Service who filed applications on or after September 15, 1995, may provide this information in the MDS long-form application.

(d) Each application proposing a new or modified antenna structure for a station (including a passive repeater or signal booster station) so as to change its overall height shall indicate whether any necessary notification of the FAA has been made. Complete information as to rules concerning the construction, marking and lighting of antenna structures is contained in part 17 of this chapter. See also § 21.111 if the structure is used by more than one station.

\* \* \* \* \*

(g) Applications in the Multipoint Distribution Service filed before September 15, 1995, proposing a new or replacement antenna (excluding omnidirectional antennas) shall include an antenna radiation pattern showing the antenna power gain distribution in the

horizontal plane expressed in decibels, unless such pattern is known to be on file with the Commission in which case the applicant may reference in its application the FCC-ID number that indicates that the pattern is on file with the Commission. Multipoint Distribution Service applicants who filed applications on or after September 15, 1995 must provide related information in completing an MDS long-form application.

\* \* \* \* \*

7. Section 21.20 is amended by revising paragraph (b)(5) to read as follows:

**§ 21.20 Defective applications.**

\* \* \* \* \*

(b) \* \* \*

(5) The application does not certify the availability of the proposed station site.

\* \* \* \* \*

8. Section 21.23 is amended by removing paragraphs (c)(1) and (d), redesignating (c)(2) through (c)(7) as paragraphs (c)(1) through (c)(6), redesignating paragraphs (e) through (g) as paragraphs (d) through (f), and revising the newly redesignated paragraphs (c)(1) introductory text, and (d)(1) to read as follows:

**§ 21.23 Amendment of applications.**

\* \* \* \* \*

(c) \* \* \*

(1) If in the Multipoint Distribution Service, the amendment results in a substantial modification of the engineering proposal such as (but not necessarily limited to):

\* \* \* \* \*

(d) \* \* \*

(1) Any applicant whose application appears on its face to be mutually exclusive with the application being amended, including those applicants originally served under § 21.902;

\* \* \* \* \*

**§ 21.27 [Amended]**

9. Section 21.27 is amended by removing paragraph (d).

**§ 21.31 [Amended]**

10. Section 21.31 is amended by removing paragraph (f).

**§ 21.33 [Amended]**

11. Section 21.33 is amended by removing paragraph (a), and redesignating paragraphs (b) through (d) as paragraphs (a) through (c) respectively.

12. Section 21.39 is amended by revising paragraph (d)(3) to read as follows:

**§ 21.39 Considerations involving transfer or assignment applications.**

\* \* \* \* \*

(d) \* \* \*

(3) The median date of the applicable commencement dates (determined pursuant to paragraphs (c) (1) and (2) of this section) if the transaction involves two or more stations. (The median date is that date so selected such that fifty percent of the commencement dates of the total number of stations, when arranged in chronological order, lie below it and fifty percent lie above it. When the number of stations is an even number, the median date will be a value half way between the two dates closest to the theoretical median).

13. Section 21.41 is amended by revising paragraphs (b) and (c) to read as follows:

**§ 21.41 Special processing of applications for minor facility modifications.**

\* \* \* \* \*

(b) An application may be considered under the procedures of this section only if:

(1) It is in the Multipoint Distribution Service;

(2) The cumulative effect of all such applications made within any 60 days period does not exceed the appropriate values prescribed by paragraph (c) of this section;

(3) The facilities to be modified are not located within 56.3 kilometers (35 miles) of the Canadian or Mexican border;

(4) It is acceptable for filing, is consistent with all of the Commission's rules, and does not involve a waiver request;

(5) It specifically requests consideration pursuant to this section;

(6) Frequency notification procedures are complied with and a copy of the application has been served on those who also were served under § 21.902; and

(7) In the Multipoint Distribution Service, the modified facility would not produce a power flux density that exceeds -73 dBW/m<sup>2</sup>, pursuant to §§ 21.902 and 21.939 at locations on the boundaries of protected service areas to which there is an unobstructed signal path.

(c) The modifications that may be authorized under the procedures of this section are:

(1) Changes in a transmitter and existing transmitter operating characteristics, or protective configuration of transmitter, provided that:

(i) In the Multipoint Distribution Service, any increase in EIRP is one and one-half dB or less over the previously-authorized power value; or

(ii) The necessary bandwidth is not increased by more than 10% of the previously authorized necessary bandwidth.

(2) Changes in the height of an antenna, provided that:

(i) In Multipoint Distribution Service, any increase in antenna height is less than 3.0 meters above the previously authorized height; and

(ii) The overall height of the antenna structure is not increased as a result of the antenna extending above the height of the previously authorized structure, except when the new height of the antenna structure is 6.1 meters or less (above ground or man-made structure, as appropriate) after the change is made.

(3) Change in the geographical coordinates of a transmit station by ten seconds or less of latitude, longitude or both, provided that when notice to the FAA of proposed construction is required by part 17 of this chapter for antenna structure at the previously authorized coordinates (or will be required at the new location) the applicant must comply with the provisions of § 21.15(d).

\* \* \* \* \*

14. Section 21.42 is amended by removing paragraph (c)(7), redesignating paragraph (c)(8) as paragraph (c)(7), and revising paragraphs (a), (b)(1), (b)(4), and (c)(3) to read as follows:

**§ 21.42 Certain modifications not requiring prior authorization.**

(a) Equipment in an authorized radio station may be replaced without prior authorization or notification if:

(1) The replacement equipment is identical (i.e., same manufacturer and model number) with the replacement equipment; or

(2) The replacement transmitter, transmitting antenna, transmission line loss and/or devices between the transmitter and antenna, or combinations of the above, do not change the EIRP of a station in any direction.

(b) Licensees of fixed stations in the Multipoint Distribution Service may make the facility changes listed in paragraph (c) of this section without obtaining prior Commission authorization, if:

(1) The Multipoint Distribution Service licensee serves a copy of the notification described in paragraph (b)(3) of this section on those who were served under § 21.902, and

\* \* \* \* \*

(4) In the Multipoint Distribution Service, the modified facility would not produce a power flux density at the protected service area boundary that

exceeds - 73 dBW/m<sup>2</sup>, pursuant to §§ 21.902 and 21.939.

(c) \* \* \*

(3) Change to an antenna when the new antenna conforms with § 21.906 and the EIRP resulting from the new antenna does not exceed that resulting from the previously authorized antenna by more than one dB in any direction.

\* \* \* \* \*

15. Section 21.43 is amended by revising paragraph (a) to read as follows:

**§ 21.43 Period of construction; certification of completion of construction.**

(a) Except for Multipoint Distribution Service station licenses granted to BTA and PSA authorization holders, each license for a radio station for the services included in this part shall specify as a condition therein the period during which construction of facilities will be completed and the station made ready for operation. Construction may not commence until the grant of a license, and must be completed by the date specified in the license as the termination date of the construction period. Except as may be limited by § 21.45(b) or otherwise determined by the Commission for any particular application, the maximum construction period for all stations licensed under this part shall be a maximum of 12 months from the date of the license grant.

\* \* \* \* \*

16. Section 21.45 is amended by revising paragraphs (a) and (c) to read as follows:

**§ 21.45 License period.**

(a)(1) Licenses for stations in the Multipoint Distribution Service will be issued for a period not to exceed 10 years, except that licenses for developmental stations will be issued for a period not to exceed one year. The expiration date of developmental licenses shall be one year from the date of the grant thereof. Unless otherwise specified by the Commission, the expiration of regular licenses shall be on the following date in the year of expiration.

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(2) When a license is granted subsequent to the last renewal date of the class of license involved, the license shall be issued only for the unexpired period of the current license term of such class.

\* \* \* \* \*

(c) Upon the expiration or termination of any station license, any related conditional authorization, which bears a later expiration date, shall be automatically terminated concurrently

with the related station license, unless it shall have been determined by the Commission that the public interest, convenience or necessity would be served by continuing in effect said conditional authorization.

17. Section 21.100 is revised to read as follows:

**§ 21.100 Frequencies.**

The frequencies available for use in the service covered by this part are listed in subpart K. Assignment of frequencies will be made only in such a manner as to facilitate the rendition of communication service on an interference-free basis in each service area. Unless otherwise indicated, each frequency available for use by stations in this service will be assigned exclusively to a single applicant in any service area. All applicants for, and licensees of, stations in this service shall cooperate in the selection and use of the frequencies assigned in order to minimize interference and thereby obtain the most effective use of the authorized facilities. In the event harmful interference occurs or appears likely to occur between two or more radio systems and such interference cannot be resolved between the licensees thereof, the Commission may, after notice and opportunity for hearing, require the licensees to make such changes in operating techniques or equipment as it may deem necessary to avoid such interference.

18. Section 21.101 is amended by removing paragraph (b), redesignating paragraph (c) as paragraph (b), and revising paragraph (a) to read as follows:

**§ 21.101 Frequency tolerance.**

(a) The carrier frequency of each transmitter authorized in these services shall be maintained within the following percentage of the reference frequency except as otherwise provided in paragraph (b) of this section or in the applicable subpart of this part (unless otherwise specified in the instrument of station authorization the reference frequency shall be deemed to be the assigned frequency):

Frequency range (MHz)	Frequency tolerance for fixed stations (percent)
2,150 to 2,162 <sup>1 2</sup> .....	0.001

Frequency range (MHz)	Frequency tolerance for fixed stations (percent)
2,596 to 2,680 <sup>2</sup> .....	0.005

<sup>1</sup> Beginning Aug. 9, 1975, this tolerance will govern the marketing of equipment pursuant to §§ 2.803 and 2.805 of this chapter and the issuance of all authorizations for new radio equipment. Until that date new equipment may be authorized with a frequency tolerance of 0.03 percent in the frequency range 2,200 to 10,500 MHz and equipment so authorized may continue to be used for its life provided that it does not cause interference to the operation of any other licensee. Equipment authorized in the frequency range 2,450 to 10,500 MHz prior to June 23, 1969, at a tolerance of 0.05 percent may continue to be used until February 1, 1976 provided it does not cause interference to the operation of any other licensee.

<sup>2</sup> Beginning November 1, 1991, equipment authorized to be operated in the frequency bands 2150-2162 MHz, 2596-2644 MHz, 2650-2656 MHz, 2662-2668 MHz, and 2674-2680 MHz for use in the Multipoint Distribution Service shall maintain a frequency tolerance within +1 KHz of the assigned frequency.

\* \* \* \* \*

**§ 21.106 [Amended]**

19. Section 21.106 is amended by removing paragraphs (a)(2)(ii), (a)(3), and (a)(4) and redesignating paragraph (a)(2)(iii) as paragraph (a)(2)(ii).

20. Section 21.107 is amended by removing paragraph (c) and revising paragraph (b) to read as follows:

**§ 21.107 Transmitter power.**

\* \* \* \* \*

(b) The EIRP of a transmitter station employed in this radio service shall not exceed the values shown in the following tabulation:

Frequency range (MHz)	Maximum allowable EIRP for a fixed station (Watts)
2,150 to 2,162 .....	1 2000
2,596 to 2,680 .....	1 2000

<sup>1</sup> When a Multipoint Distribution Service station uses a non-omnidirectional antenna EIRP up to 7943 Watts may be authorized pursuant to § 21.904(b) of this Part.

**§ 21.108 [Removed and reserved]**

21. Section 21.108 is removed and reserved.

22. Section 21.109 is amended by revising paragraph (b) to read as follows:

**§ 21.109 Antenna and antenna structures.**

\* \* \* \* \*

(b) The Commission may require the replacement, at the licensee's expense, of any antenna system of a permanent fixed station operating at 2500 MHz or higher upon a showing that said

antenna causes or is likely to cause interference to any other authorized or proposed station.

**§ 21.114 [Removed and reserved]**

23. Section 21.114 is removed and reserved.

**§ 21.119 [Removed and reserved]**

24. Section 21.119 is removed and reserved.

25. Section 21.120 is amended by removing paragraphs (d) and (e), and revising paragraph (a) to read as follows:

**§ 21.120 Authorization of transmitters.**

(a) Except for transmitters used at developmental stations, each transmitter shall be a type which has been type accepted by the Commission for use under the applicable rules of this part.

\* \* \* \* \*

26. Section 21.122 is amended by revising paragraph (a) and removing paragraphs (d) and (e), to read as follows:

**§ 21.122 Microwave digital modulation.**

(a) Microwave transmitters employing digital modulation techniques and operating below 15 GHz shall, with appropriate multiplex equipment, comply with the following additional requirement: The bit rate, in bits per second, shall be equal to or greater than the bandwidth specified by the emission designator in Hertz (e.g., to be acceptable, equipment transmitting at a 6 Mb/s rate must not require a bandwidth of greater than 6 MHz), except the bandwidth used to calculate the minimum rate shall not include any authorized guard band.

\* \* \* \* \*

**§§ 21.212–21.214 [Removed]**

27. Sections 21.212 through 21.214 are removed.

28. Section 21.303 is amended by revising paragraphs (a), (b), (c) and (d)(1) to read as follows:

**§ 21.303 Discontinuance, reduction or impairment of service.**

(a) If the public communication service provided by a station subject to this rule part is involuntarily discontinued, reduced or impaired for a period exceeding 48 hours, the station licensee shall promptly give notification thereof in writing to the Mass Media Bureau at Washington, DC 20554. In every such case, the licensee shall furnish full particulars as to the reasons for such discontinuance, reduction or impairment of service, including a statement as to when normal service is expected to be resumed. When normal service is resumed, prompt notification thereof shall be given in writing to the

Mass Media Bureau at Washington, DC 20554.

(b) No station licensee subject to title II of the Communications Act of 1934, as amended, shall voluntarily discontinue, reduce or impair public communication service to a community or part of a community without obtaining prior authorization from the Commission pursuant to the procedures set forth in part 63 of this chapter or complying with the requirements set forth at § 21.910. In the event that permanent discontinuance of service is authorized by the Commission, the station licensee shall promptly send the station license for cancellation to the Mass Media Bureau at Washington, DC 20554, except that station licenses need not be surrendered for cancellation if the discontinuance is a result of a change of status by a Multipoint Distribution Service licensee from common carrier to non-common carrier pursuant to § 21.910.

(c) Any station licensee, not subject to title II of the Communications Act of 1934, as amended, who voluntarily discontinues, reduces or impairs public communication service to a community or a part of a community shall give written notification to the Commission within 7 days thereof. In the event of permanent discontinuance of service, the station licensee shall promptly send the station license for cancellation to the Mass Media Bureau at Washington, DC 20554, except that Multipoint Distribution Service station licenses need not be surrendered for cancellation if the discontinuance is a result of a change of status by a Multipoint Distribution Service licensee from non-common carrier to common carrier.

(d) \* \* \*

(1) Submit for cancellation the station license (or licenses) to the Commission at Washington, DC 20554.

\* \* \* \* \*

**§§ 21.500–21.512 (Subpart G) [Removed and reserved]**

29. Subpart G of part 21 (21.500 through 21.512) is removed and reserved.

**§§ 21.700–21.713 (Subpart I) [Removed and reserved]**

30. Subpart I of part 21 (21.700 through 21.713) is removed and reserved.

**§§ 21.800–21.809 (Subpart J) [Removed and reserved]**

31. Subpart J of part 21 (21.800 through 21.809) is removed and reserved.

32. Section 21.901 is amended by revising paragraph (e) to read as follows:

**§ 21.901 Frequencies.**

\* \* \* \* \*

(e) Frequencies in the band segments 18,580–18,820 MHz and 18,920–19,160 MHz are available for assignment to fixed stations in this service for a point-to-point return link from a subscriber's location. Assignments in the 18 GHz band for these return links will be made in accordance with the provisions of subpart I of part 101 of this chapter.

\* \* \* \* \*

33. Section 21.902 is amended by revising paragraph (c)(1)(ii) to read as follows:

**§ 21.902 Frequency interference.**

\* \* \* \* \*

(c) \* \* \*

(1) \* \* \*

(ii) if the great circle path between the applicant's proposed transmitter and the protected service area of any authorized, or previously-proposed, cochannel or adjacent-channel station(s) is within 241.4 kilometers or less and 90 percent or more of the path is over water or within 16.1 kilometers of the coast or shoreline of the Atlantic Ocean, the Pacific Ocean, the Gulf of Mexico, any of the Great Lakes, or any bay associated with any of the above (see §§ 21.901(a) and 74.902 of this chapter);

\* \* \* \* \*

34. Section 21.903 is amended by revising paragraph (a) to read as follows:

**§ 21.903 Purpose and permissible service.**

(a) Multipoint Distribution Service stations are generally intended to provide one-way radio transmission (usually in an omnidirectional pattern) from a stationary transmitter to multiple receiving facilities located at fixed points. When service is provided on a common carrier basis, subscriber supplied information is transmitted to points designated by the subscriber. When service is provided on a non-common carrier basis, transmissions may include information originated by persons other than the licensee, licensee-manipulated information supplied by other persons, or information originated by the licensee. Point-to-point radio return links from a subscriber's location to a MDS operator's facilities may be authorized in the 18,580 through 18,820 MHz and 18,920 through 19,160 MHz bands. Rules governing such operation are contained in subpart I of part 101 of this chapter, the Point-to-Point Microwave Radio Service.

\* \* \* \* \*

**PART 94—[REMOVED AND RESERVED]**

35. Part 94 is removed and reserved.

36. Part 101 is added to read as follows:

**PART 101—FIXED MICROWAVE SERVICES****Subpart A—General**

Sec.

- 101.1 Scope and authority.  
101.3 Definitions.

**Subpart B—Applications and Licenses***General Filing Requirements*

- 101.4 Transition plan.  
101.5 Station authorization required.  
101.7 Eligibility for station license.  
101.9 Formal and informal applications.  
101.11 Filing of applications, fees, and number of copies.  
101.13 Application forms and requirements for private operational fixed stations.  
101.15 Application forms for common carrier fixed stations.  
101.17 [Reserved]  
101.19 General application requirements.  
101.21 Technical content of applications.  
101.23 Waiver of rules.  
101.25 Inconsistent or conflicting applications.  
101.27 Repetitious applications.  
101.29 Amendment of pending applications.  
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101.33 Who may sign applications.

*Processing of Applications*

- 101.35 Preliminary processing of applications.  
101.37 Public notice period.  
101.39 Dismissal and return of applications.  
101.41 Ownership changes and agreements to amend or dismiss applications or pleadings.  
101.43 Opposition to applications.  
101.45 Mutually exclusive applications.  
101.47 Consideration of applications.  
101.49 Grants by random selection.  
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*License Transfers, Modifications, Conditions and Forfeitures*

- 101.53 Assignment or transfer of station authorization.  
101.55 Considerations involving transfer or assignment applications.  
101.57 Modification of station license.  
101.59 Processing of applications for facility minor modifications.  
101.61 Certain modifications not requiring prior authorization.  
101.63 Period of construction; certification of completion of construction.  
101.65 Forfeiture and termination of station authorizations.  
101.67 License period.

- 101.69 Transition of the 2.11–2.13 and 2.16–2.18 GHz bands from the Common Carrier Fixed Point-to-Point Microwave Services and the 1.85–1.99, 2.13–2.15, and 2.18–2.20 GHz bands from the Private Operational Fixed Point-to-Point Microwave Service to emerging technologies.

**Subpart C—Technical Standards**

- 101.101 Frequency availability.  
101.103 Frequency coordination procedures.  
101.105 Interference protection criteria.  
101.107 Frequency tolerance.  
101.109 Bandwidth.  
101.111 Emission limitations.  
101.113 Transmitter power limitations.  
101.115 Directional antennas.  
101.117 Antenna polarization.  
101.119 Simultaneous use of common antenna structures.  
101.121 Marking of antenna structures.  
101.123 Quiet zones.  
101.125 Temporary fixed antenna height restrictions.  
101.127 Topographical data.  
101.129 Transmitter location.  
101.131 Transmitter construction and installation.  
101.133 Limitations on use of transmitters.  
101.135 Shared use of radio stations and the offering of private carrier service.  
101.137 Interconnection of private operational fixed point-to-point microwave stations.  
101.139 Authorization of transmitters.  
101.141 Microwave modulation.  
101.143 Minimum path length requirements.  
101.145 Interference to geostationary-satellites.  
101.147 Frequency assignments.  
101.149 Special requirements for operation in the band 38,600–40,000 MHz.

**Subpart D—Technical Operation**

- 101.201 Station inspection.  
101.203 Communications concerning safety of life and property.  
101.205 Operation during emergency.  
101.207 Suspension of transmission.  
101.209 Operation of stations at temporary fixed locations for communication between the United States and Canada or Mexico.  
101.211 Operator requirements.  
101.213 Station identification.  
101.215 Posting of station authorization and transmitter identification cards, plates, or signs.  
101.217 Station records.

**Subpart E—Miscellaneous Common Carrier Provisions**

- 101.301 National defense; free service.  
101.303 Answers to notices of violation.  
101.305 Discontinuance, reduction or impairment of service.  
101.307 Tariffs, reports, and other material required to be submitted to the Commission.  
101.309 Requirement that licensees respond to official communications.  
101.311 Equal employment opportunities.

**Subpart F—Developmental Authorizations**

- 101.401 Eligibility.  
101.403 Scope of service.  
101.405 Adherence to program of research and development.  
101.407 Special procedure for the development of a new service or for the use of frequencies not in accordance with the provisions of the rules in this part.  
101.409 Terms of grant; general limitations.  
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**Subpart G—Digital Electronic Message Service**

- 101.501 Eligibility.  
101.503 Digital Electronic Message Service Nodal Stations.  
101.505 Frequencies.  
101.507 Frequency stability.  
101.509 Interference protection criteria.  
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101.513 Transmitter power.  
101.515 Emissions and bandwidth.  
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**Subpart H—Private Operational Fixed Point-to-Point Microwave Service**

- 101.601 Eligibility.  
101.603 Permissible communications.

**Subpart I—Common Carrier Fixed Point-to-Point Microwave Service**

- 101.701 Eligibility.  
101.703 Permissible communications.  
101.705 Renewal of station licenses.

**Subpart J—Local Television Transmission Service**

- 101.801 Eligibility.  
101.803 Frequencies.  
101.805 Assignment of frequencies to mobile stations.  
101.807 Transmitter power.  
101.809 Bandwidth and emission limitations.  
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101.813 Remote control operation of mobile television pickup stations.  
101.815 Stations at temporary fixed locations.  
101.817 Notification of station operation at temporary locations.  
101.819 Stations affected by coordination contour procedures.

Authority: 47 U.S.C. 154, 303, unless otherwise noted.

**Subpart A—General****§ 101.1 Scope and authority.**

(a) The purpose of the rules in this part is to prescribe the manner in which portions of the radio spectrum may be made available for private operational and common carrier fixed microwave operations that require transmitting facilities on land or in specified offshore coastal areas within the continental shelf.

(b) The rules in this part are issued pursuant to the authority contained in

Titles I through III of the Communications Act of 1934, as amended, which vest authority in the Federal Communications Commission to regulate common carriers of interstate and foreign communications, to regulate radio transmissions and issue licenses for radio stations, and to regulate all interstate and foreign communications by wire and radio necessary to the accomplishment of the purposes of the Act.

### § 101.3 Definitions.

As used in this part.

**Antenna power gain.** The ratio of the maximum radiation intensity to that of an isotropic (omnidirectional) radiator in the far field of its main (forward direction) lobe.

**Antenna power input.** The radio frequency peak or RMS power, as the case may be, supplied to the antenna from the antenna transmission line and its associated impedance matching network.

**Antenna structure.** The antenna, its supporting structure and anything attached to it.

**Assigned frequency.** The center of the frequency band assigned to a station.

**Assigned frequency bandwidth.** The frequency band within which the emission of a station is authorized; the width of the band equals the necessary bandwidth plus twice the absolute value of the frequency tolerance.

**Authorized bandwidth.** The maximum bandwidth authorized to be used by a station as specified in the station license. (See § 2.202 of this chapter)

**Authorized frequency.** The frequency, or frequency range, assigned to a station by the Commission and specified in the instrument of authorization.

**Authorized power.** The maximum power a station is permitted to use. This power is specified by the Commission in the station's authorization.

**Automatic Transmitter Power Control (ATPC).** ATPC is a feature of a digital microwave radio system that adjusts the transmitter output power. ATPC allows the transmitter to operate at less than maximum power for most of the time. In a radio employing ATPC, the transmit power is reduced during normal operation conditions. When the receiver detects a reduction in signal level, a control signal is sent to the far end transmitter, instructing it to increase the power output to compensate for the signal reduction. The power output is limited to the licensed (maximum) transmit power. Guidelines for use of ATPC are set forth in the TIA Telecommunications Systems Bulletin

TSB 10, "Interference Criteria for Microwave Systems (TSB 10)."

**Bandwidth occupied by an emission.** The band of frequencies comprising 99 percent of the total radiated power extended to include any discrete frequency on which the power is at least 0.25 percent of the total radiated power.

**Bit rate.** The rate of transmission of information in binary (two state) form in bits per unit time.

**Carrier.** In a frequency stabilized system, the sinusoidal component of a modulated wave whose frequency is independent of the modulating wave; or the output of a transmitter when the modulating wave is made zero; or a wave generated at a point in the transmitting system and subsequently modulated by the signal; or a wave generated locally at the receiving terminal which when combined with the side bands in a suitable detector, produces the modulating wave.

**Carrier frequency.** The output of a transmitter when the modulating wave is made zero.

**Central office.** A landline termination center used for switching and interconnection of public message communication circuits.

**Common carrier fixed point-to-point microwave service.** A common carrier public radio service rendered on microwave frequencies by fixed and temporary fixed stations between points that lie within the United States or between points to its possessions or to points in Canada or Mexico.

**Communication common carrier.** Any person engaged in rendering communication service for hire to the public.

**Control point.** An operating position at which an operator responsible for the operation of the transmitter is stationed and which is under the control and supervision of the licensee.

**Control station.** A fixed station, the transmissions of which are used to control automatically the emissions or operations of a radio station, or a remote base station transmitter.

**Coordination area.** The area associated with a station outside of which another station sharing the same or adjacent frequency band neither causes nor is subject to interfering emissions greater than a permissible level.

**Coordination contour.** The line enclosing the coordination area.

**Coordination distance.** The distance on a given azimuth from a station beyond which another station neither causes nor is subject to interfering emissions greater than a permissible level.

**Digital Electronic Message Nodal Station.** A fixed point-to-multipoint radio station in a Digital Electronic Message Service providing two-way communication with Digital Electronic Message User Stations.

**Digital Electronic Message Service.** A two-way end-to-end fixed radio service utilizing digital termination systems for the exchange of digital information. This service may also make use of point-to-point microwave facilities, satellite facilities or other communications media to interconnect digital termination systems to comprise a network.

**Digital Electronic Message User Station.** Any one of the fixed microwave radio stations located at users' premises, lying within the coverage area of a Digital Electronic Message Nodal Station, and providing two-way digital communications with the Digital Electronic Message Nodal Station.

**Digital modulation.** The process by which some characteristic (frequency, phase, amplitude or combinations thereof) of a carrier frequency is varied in accordance with a digital signal, e.g., one consisting of coded pulses or states.

**Drop point.** A term used in the point-to-point microwave radio service to designate a terminal point where service is rendered to a subscriber.

**Earth station.** A station located either on the Earth's surface or within the major portion of Earth's atmosphere and intended for communication:

- (1) With one or more space stations; or
- (2) With one or more stations of the same kind by means of one or more reflecting satellites or other objects in space.

**Effective radiated power (ERP).** The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction.

**Equivalent Isotropically Radiated Power (EIRP).** The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

**Exchange.** A unit of a communication company or companies for the administration of communication service in a specified area, which usually embraces a city, town, or village and its environs, and consisting of one or more central offices, together with the associated plant, used in furnishing communication service in that area.

**Exchange area.** The geographic area included within the boundaries of an exchange.

**Fixed satellite earth station.** An earth station intended to be used at a specified fixed point.

**Fixed relay station.** A fixed station associated with one or more stations, established to receive radio signals directed to it and to retransmit them automatically on a fixed service frequency.

**Fixed Service.** A radio communications service between specified fixed points.

**Fixed station.** A station in the fixed service.

**Frequency tolerance.** The maximum permissible departure by the center frequency of the frequency band occupied by an emission from the assigned frequency or, by the characteristic frequency of an emission from the reference frequency.

Note: The frequency tolerance is expressed as a percentage or in Hertz.

**General communication.** Two-way voice communication, through a base station, between:

- (1) A common carrier land mobile or airborne station and a landline telephone station connected to a public message landline telephone system;
- (2) Two common carrier land mobile stations;
- (3) Two common carrier airborne stations;
- (4) A common carrier land mobile station and a common carrier airborne station.

**Harmful interference.** Interference that endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunication service operating in accordance with these regulations.

**Internodal link.** A point-to-point communications link used to provide communications between nodal stations or to interconnect nodal stations to other communications media.

**Landing area.** A landing area means any locality, either of land or water, including airports and intermediate landing fields, which is used, or approved for use for the landing and take-off of aircraft, whether or not facilities are provided for the shelter, servicing, or repair of aircraft, or for receiving or discharging passengers or cargo.

**Local Television Transmission Service.** A public radio communication service for the transmission of television material and related communications.

**Long haul system.** A microwave system licensed under this part in which the longest radio circuit of tandem radio paths exceeds 402 kilometers.

**Master station.** A station in a multiple address radio system that controls, activates or interrogates four or more

remote stations. Master stations performing such functions may also receive transmissions from remote stations.

**Message center.** The point at which messages from members of the public are accepted by the carrier for transmission to the addressee.

**Microwave frequencies.** As used in this part, this term refers to frequencies of 890 MHz and above.

**Microwave link.** A link is defined as a simplex communications circuit between two points utilizing a single frequency/polarization assignment. A duplex communications circuit would require two links, one link in each direction.

**Miscellaneous common carriers.** Communications common carriers that are not engaged in the business of providing either a public landline message telephone service or public message telegraph service.

**Mobile earth station.** An earth station intended to be used while in motion or during halts at unspecified points.

**Mobile Service.** A radio communication service between mobile and land stations or between mobile stations.

**Mobile station.** A station in the mobile service intended to be used while in motion or during halts at unspecified points.

**Multiple address system (MAS).** A point-to-multipoint radio communications system, either one-way or two-way, utilizing frequencies in accordance with § 101.147 and serving a minimum of four unique remote stations. Each master station must serve at least its own four remotes. The remote stations must be scattered over the service area in such a way that two or more point-to-point systems would be needed to serve those remotes.

**National Spatial Reference System.** The National Spatial Reference System (NSRS) is the name given to all Geodetic Control information contained in the National Geodetic Survey (NGS) Data Base. This includes: A, B, First, Second, and Third Order horizontal and vertical control observed by NGS as well as data submitted by other agencies (i.e., USGS, BLM, States, Counties, Cities, and private surveying organizations).

**Necessary bandwidth.** For a given class of emission, the width of the frequency band that is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions. The necessary bandwidth may be calculated using the formulas in § 2.202 of this chapter.

**Nodal station.** The central or controlling station in a radio system

operating on point-to-multipoint frequencies in the 2.5, 10.6, or 18 GHz bands.

**Occupied bandwidth.** The width of a frequency bandwidth such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage, B/2 of the total mean power of a given emission. Unless otherwise specified by the CCIR for the appropriate class of emission, the value of B/2 should be taken as 0.5%.

Note: The percentage of the total power outside the occupied bandwidth is represented by B.

**Operational fixed station.** A private fixed station not open to public correspondence.

**Passive repeater.** A re-radiation device associated with a transmitting/receiving antenna system that re-directs intercepted radiofrequency energy. For example, it may consist of reflector(s) or back-to-back parabolic or horn antennas.

**Path length.** The total distance of a path from the transmit to the receive antenna, inclusive of all passive repeaters, if any.

**Periscope antenna system.** An antenna system which involves the use of a passive reflector to deflect radiation from or to a directional transmitting or receiving antenna which is oriented vertically or near vertically.

**Prior coordination.** A bilateral process conducted prior to filing applications which includes the distribution of the technical parameters of a proposed radio system to potentially affected parties for their evaluation and timely response.

**Private carrier.** An entity licensed in the private service and authorized to provide communications service to other private service eligibles on a commercial basis.

**Private line service.** A service whereby facilities for communication between two or more designated points are set aside for the exclusive use or availability for use of a particular customer and authorized users during stated periods of time.

**Private operational fixed point-to-point microwave service.** A private line radio service rendered on microwave frequencies by fixed and temporary fixed stations between points that lie within the United States or between points to its possessions or to points in Canada or Mexico.

**Public correspondence.** Any telecommunication which the offices and stations must, by reason of their being at the disposal of the public, accept for transmission.

**Public message service.** A service whereby facilities are offered to the

public for communication between all points served by a carrier or by interconnected carriers on a non-exclusive message by message basis, contemplating a separate connection for each occasion of use.

**Radio station.** A separate transmitter or a group of transmitters under simultaneous common control, including the accessory equipment required for carrying on a radiocommunication service.

**Radiocommunication.** Telecommunication by means of radio waves.

**Rated power output.** The maximum radio frequency power output capability (peak or average power) of a transmitter, under optimum conditions of adjustment and operation, specified by its manufacturer.

**Record communication.** Any transmission of intelligence which is reduced to visual record form at the point of reception.

**Reference frequency.** A frequency having a fixed and specified position with respect to the assigned frequency. The displacement of this frequency with respect to the assigned frequency has the same absolute value and sign that the displacement of the characteristic frequency has with respect to the centre of the frequency band occupied by the emission.

**Relay station.** A fixed station used for the reception and retransmission of the signals of another station or stations.

**Remote station.** A fixed station in a multiple address radio system that transmits one-way to one or more central receive sites, controls a master station, or is controlled, activated or interrogated by, and may respond to, a master station.

**Repeater station.** A fixed station established for the automatic retransmission of radiocommunications received from one or more mobile stations and directed to a specified location; for public mobile radio operations, a fixed station that automatically retransmits the mobile communications and/or transmitter information about the base station, along a fixed point-to-point link between the base station and the central station.

**Short haul system.** A microwave system licensed under this part in which the longest radio circuit of tandem radio paths does not exceed 402 kilometers.

**Signaling communication.** One-way communications from a base station to a mobile or fixed receiver, or to multi-point mobile or fixed receivers by audible or subaudible means, for the purpose of actuating a signaling device

in the receiver(s) or communicating information to the receiver(s), whether or not the information is to be retained in record form.

**Standby transmitter.** A transmitter installed and maintained for use in lieu of the main transmitter only during periods when the main transmitter is out of service for maintenance or repair.

**Symbol rate.** Modulation rate in bauds. This rate may be higher than the transmitted bit rate as in the case of coded pulses or lower as in the case of multilevel transmission.

**Telegraphy.** A form of telecommunication which is concerned in any process providing transmission and reproduction at a distance of documentary matter, such as written or printed matter or fixed images, or the reproduction at a distance of any kind of information in such a form. Unless otherwise specified, telegraphy means a form of telecommunication for the transmission of written matter by the use of signal code.

**Telemetry.** The use of telecommunication for automatic indicating or recording measurements at a distance from the measuring instrument.

**Telephony.** A form of telecommunication set up for the transmission of speech, or in some cases, other sounds.

**Television.** A form of telecommunication for transmission of transient images of fixed or moving objects.

**Temporary fixed station.** A station established in a non-permanent mode (temporary) at a specified location for a short period of time, ranging up to one year. Temporary-fixed operations are itinerant in nature, and are not to be confused with mobile-type operations.

**Video entertainment material.** The transmission of a video signal (e.g. United States Standard Monochrome or National Television Systems Committee 525-line television) and an associated audio signal which is designed primarily to amuse or entertain, such as movies and games.

## Subpart B—Applications and Licenses

### General Filing Requirements

#### § 101.4 Transition plan.

(a) All systems subject to parts 21 and 94 of this chapter in effect as of July 31, 1996, which are licensed or which are proposed in an application on file, as of July 31, 1996, are subject to the requirements under part 21 or part 94 of this chapter as contained in the CFR edition revised as of October 1, 1995 and amended in the Federal Register through July 31, 1996, as applicable.

(b) For purposes of this section, a "system" shall include:

- (1) The originally licensed system;
- (2) Any modification to the original system involving a change in antenna azimuth, antenna beam width, channel loading, emission, station location, antenna height, authorized power, or authorized frequencies;
- (3) Additional links constructed to complete an integrated communications network; or
- (4) Operationally connecting new facilities and/or frequencies.

(c) All radio frequency devices authorized pursuant to part 2 of this chapter as being in compliance with applicable part 21 or part 94 of this chapter in effect as of July 31, 1996, requirements can be used indefinitely with systems licensed under this part 101.

#### § 101.5 Station authorization required.

(a) No radio transmitter shall be operated in this service except under and in accordance with a proper station authorization granted by the Federal Communications Commission. Except as provided in paragraph (d) of this section, no construction, modification or operation of a station may be commenced without an authorization from the Commission.

(b) A separate application form must be filed for each Digital Electronic Message Service Nodal Station. No license is required for a Digital Electronic Message User Station. Authority for a Digital Electronic Message Nodal Station licensee to serve a specific number of user stations to be licensed in the name of the carrier must be requested on FCC Form 494 filed for the Digital Electronic Message Nodal Station.

(c) If construction and or operation may have a significant environmental impact as defined by § 1.1307 of this chapter, the requisite environmental assessment as prescribed in § 1.1311 of this chapter must be filed with the application and Commission environmental review must be completed before construction of the station is initiated. See § 1.1312 of this chapter.

(d) For stations authorized under subpart H (Private Operational Fixed Point-to-Point Microwave Service) and subpart I (Common Carrier Fixed Point-to-Point Microwave Service), construction of new or modified stations may be initiated prior to grant of an authorization. As a condition to commencing construction under this paragraph (d), the Commission may, at any time and without hearing or notice, prohibit such construction for any

reason. Any construction conducted hereunder is at the applicant's sole risk.

**§ 101.7 Eligibility for station license.**

(a) A station license may not be granted to or held by a foreign government or by a representative of a foreign government.

(b) In the Common Carrier service, a station license may not be granted or held by:

(1) Any alien or the representative of any alien;

(2) Any corporation organized under the laws of any foreign government;

(3) Any corporation of which any officer or director is an alien;

(4) Any corporation of which more than one-fifth of the capital stock is owned of record or voted by: Aliens or their representatives; a foreign government or representatives thereof; or any corporation organized under the laws of a foreign country;

(5) Any corporation directly or indirectly controlled by any other corporation of which any officer or more than one-fourth of the directors are aliens, if the Commission finds that the public interest will be served by the refusal or revocation of such license; or

(6) Any corporation directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens or their representatives, or by a foreign government or representative thereof, or by any corporation organized under the laws of a foreign government, if the Commission finds that the public interest will be served by the refusal or revocation of such license.

**§ 101.9 Formal and informal applications.**

(a) Except for an authorization under any of the proviso clauses of section 308(a) of the Communications Act of 1934 (47 U.S.C. 308(a)), the Commission will grant the following authorizations only upon written application: Station licenses; modifications of station licenses; renewals of station licenses; extensions of time to construct; transfers and assignments of station licenses or of any rights thereunder.

(b) Except as may be otherwise permitted by this part, a separate written application must be filed for each instrument of authorization requested. Applications may be:

(1) "Formal applications" where the Commission has prescribed in this part a standard form; or

(2) "Informal applications" (normally in letter form) where the Commission has not prescribed a standard form.

(c) An informal application will be accepted for filing only if:

(1) A standard form is not prescribed or clearly applicable to the authorization requested;

(2) It is a document submitted, in duplicate, with a caption which indicates clearly the nature of the request, radio service involved, location of the station, and the application file number (if known); and

(3) It contains all the technical details and informational showings required by the rules and states clearly and completely the facts involved and authorization desired.

**§ 101.11 Filing of applications, fees, and number of copies.**

(a) Part 1 of this chapter contains information on application filing procedures and requirements for all services authorized under this part. All filings must include the original application plus one copy.

(b) Applications or filings requiring fees as set forth at part 1, subpart G of this chapter must be filed in accordance with § 0.401(b) of this chapter. Applications or filings not requiring fees must be submitted to: Federal Communications Commission, Common Carrier Radio Services, 1270 Fairfield Road, Gettysburg, PA 17325.

(c) All correspondence or amendments concerning a submitted application must clearly identify the radio service, the name of the applicant, station location, and the Commission file number (if known) or station call sign of the application involved.

(d) Except as otherwise specified, all applications, amendments, and correspondence must be signed as prescribed by part 1 of this chapter.

**§ 101.13 Application forms and requirements for private operational fixed stations.**

(a) A separate application must be submitted on FCC Form 402 for the following:

(1) New station authorization for private operational fixed microwave station;

(2) New authorization to operate one or more fixed stations at temporary locations in this service;

(3) Modification of station license;

(4) New station authorization or modification of license for each master station of a system consisting of a master station and its associated remote stations;

(5) The Commission's consent to the complete or partial assignment of an authorization to another person or entity, or the transfer of control of an entity holding an authorization. In addition, the application must be accompanied by a signed letter from

proposed assignor/transferor stating the desire to assign all or part of its right, title, and interest in and to such authorization, or to transfer control over the entity holding the authorization, stating the call sign and location of the station, and that, if applicable, the assignor will submit its current station authorization for cancellation upon completion of the assignment. Form 1046 may be used in lieu of this letter. Licensees who fail to consummate must modify their licenses to conform them to their initial state within 30 days of a failure to consummate; or

(6) Amendment of any application.

(b) An application for authority to operate a fixed station at temporary locations must specify the precise geographic area within which the operation will be confined. The area specified must be defined as a radius of operation about a given state or states, latitude/longitude, or as a rectangular area bounded by upper and lower lines of latitude and longitude. Exception to this specific requirement may be made for exceptionally large areas, such as the continental United States. Sufficient data must be submitted to show the need for the proposed area of operation. If an operational-fixed station is authorized to be operated at temporary locations and actually remains, or is to remain, at the same location for a period of over a year, application for a permanent authorization specifying the fixed location must be made as soon as possible but not later than 30 days after the expiration of the one-year period.

(c) A separate Form 402 for point-to-multipoint frequencies in the 10.6 GHz and 18 GHz bands must be filed for each Nodal Station except for operations consistent with § 101.147. Each Nodal Station application must specify the service area that will be served by the station in terms of a distance radius or other geographical specification, and, if applicable, the Standard Metropolitan Statistical Area (SMSA) being served.

(d) Application for renewal of station licenses must be submitted on such form as the Commission may designate by public notice. Applications for renewal must be made during the license term and should be filed within 90 days, but not later than 30 days, prior to the end of the license term. When a licensee submits a timely application for renewal of a station license, the existing license for that station will continue as a valid authorization until the Commission has made a final decision on the application. Whenever a group of station licenses in the same radio service are to be renewed simultaneously, a single "blanket" application may be filed to cover the

entire group if the application identifies each station by call sign and station location. Applicants should note also any special renewal requirements under the rules for such radio station(s).

(e) A separate application must be filed for each fixed master station in a Multiple Address System (MAS). Applications may include any number of remote stations in a single application, but must specify the geographic service area in which these remote stations will be located. Applications for mobile operations or for systems employing only remote stations must designate a reference point (set of coordinates) at or near the center of the area being served.

(f) Cancellation of a license can be made by letter.

**§ 101.15 Application forms for common carrier fixed stations.**

(a) *New or modified facilities.* FCC Form 494 must be submitted and a license granted for each station. FCC Form 494 also must be submitted to amend any license application, to modify any license pursuant to §§ 101.57(a) and 101.59, and to notify the Commission of modifications made pursuant to § 101.61. Cancellation of a license can be made by letter.

(b) *Additional time to construct.* FCC Form 701 ("Application for Additional Time to Construct Radio Station") must be filed prior to the expiration of the time for construction noted in a conditional license to modify the license by extending the period of construction.

(c) *Renewal of station license.* Except for renewal of special temporary authorizations, FCC Form 405 ("Application for Renewal of Station License") must be filed by the licensee between thirty (30) and sixty (60) days prior to the expiration date of the license sought to be renewed. Whenever a group of station licenses in the same radio service are to be renewed simultaneously, a single "blanket" application may be filed to cover the entire group if the application identifies each station by call sign and station location. Applicants should note also any special renewal requirements under the rules for each radio service. When a licensee submits a timely application for renewal of a station license, the existing license continues in effect until the Commission has rendered a decision on the renewal application.

(d) *Assignment of license.* FCC Form 702 ("Application for Consent to Assignment of Radio Station Construction Authorization or License for Stations in Services Other than Broadcast") must be submitted to assign

voluntarily (as by, for example, contract or other agreement) or involuntarily (as by, for example, death, bankruptcy, or legal disability) the station authorization. In the case of involuntary assignment (or transfer of control) the application must be filed within 10 days of the event causing the assignment (or transfer of control). FCC Form 702 must also be used for non-substantial (pro forma) assignments. Whenever a group of station licenses in the same radio services are to be assigned to a single assignee, a single "blanket" application may be filed to cover the entire group, if the application identifies each station by call sign and station location. Licensees who fail to consummate must modify their licenses to conform them to their initial state within 30 days of a failure to consummate.

(e) *Partial assignment of license.*

Authorization for assignment from one company to another of only a part or portions of the facilities (transmitters) authorized under an existing license (as distinguished from an assignment of the facilities in their entirety) may be granted upon application:

(1) By the assignor on FCC Form 494 for deletion of the assigned facilities (no fee required); and

(2) By the assignee on FCC Form 494 with a request for recertification in the name of the assignee for frequencies eliminated from assignor's license (fee required). In the event that consummation does not occur, FCC Form 494 must be submitted to return the assignor's license to its original condition.

(f) *Transfer of control of corporation holding a conditional license or license.* FCC Form 704 ("Application for Consent to Transfer of Control") must be submitted in order to voluntarily or involuntarily transfer control (de jure or de facto) of a corporation holding any conditional licenses or licenses. FCC Form 704 must also be used for non-substantial (pro forma) transfers of control. Licensees who fail to consummate must modify their licenses to conform them to their initial state within 30 days of a failure to consummate.

**§ 101.17 [Reserved]**

**§ 101.19 General application requirements.**

(a) Each application for a license or for consent to assignment or transfer of control must:

(1) Disclose fully the real party (or parties) in interest, including (as required) a complete disclosure of the identity and relationship of those persons or entities directly or indirectly

owning or controlling (or both) the applicant;

(2) Demonstrate the applicant's legal, technical, and other qualifications to be a licensee;

(3) Submit the information required by the Commission's rules, requests, and application forms;

(4) Be maintained by the applicant substantially accurate and complete in all significant respects in accordance with the provisions of § 1.65 of this chapter; and

(5) Show compliance with the special requirements applicable to each radio service and make all special showings that may be applicable (e.g., those required by §§ 101.103(d), 101.701, and of this part, etc.).

(b) In addition to the general application requirements of §§ 101.19 and 101.21, applicants must submit any additional documents, exhibits, or signed written statements of fact:

(1) As may be required by the other parts of the Commission's rules, and the other subparts of this part (particularly Subpart C and those subparts applicable to the specific radio service involved); and

(2) As the Commission, at any time after the filing of an application and during the term of any authorization, may require from any applicant, permittee, or licensee to enable it to determine whether a radio authorization should be granted, denied, or revoked.

(c) All applicants are required to indicate at the time their application is filed whether an authorization of the facilities is categorically excluded as defined by § 1.1306 of this chapter. If answered affirmatively, an Environmental Assessment as described by § 1.1311 of this chapter, need not be filed with the application.

**§ 101.21 Technical content of applications.**

Applications must contain all technical information required by the application form and any additional information necessary to fully describe the proposed facilities and to demonstrate compliance with all technical requirements of the rules governing the radio service involved (see subparts C, F, G, I, and J, as appropriate). The following paragraphs describe a number of technical requirements.

(a) Each application proposing a new or modified antenna structure for a station (including a receive-only or passive repeater) must indicate whether the owner has registered the structure with the Commission. Complete information as to rules concerning the registration, construction, marking and lighting of antenna structures is

contained in part 17 of this chapter. See also § 101.121 if the structure is used by more than one station.

(b) Each application for construction permit for a developmental authorization must be accompanied by pertinent supplemental information as required by § 101.411 in addition to such information as may be specifically required by this section.

(c) An applicant proposing construction of one or more new stations or modification of existing stations must submit the location and telephone number (if known) of the maintenance center for a fixed microwave system. In lieu of providing the location and telephone number of the maintenance center(s) on a case by case basis, a licensee may file a complete list for all operational stations with the Commission and the Engineer-In-Charge of the appropriate radio district on an annual basis or at more frequent intervals as necessary to keep the information current.

(d) Each application in the Private Operational Fixed Point-to-Point Microwave, Common Carrier Fixed Point-to-Point Microwave, Local Television Transmission, and Digital Electronic Message Services (excluding user stations) proposing a new or replacement antenna (excluding omnidirectional antennas) must include an antenna radiation pattern showing the antenna power gain distribution in the horizontal plane expressed in decibels, unless such pattern is known to be on file with the Commission in which case the applicant may reference in its application the FCC-ID number that indicates that the pattern is on file with the Commission.

(e) Each application in the Private Operational Fixed Point-to-Point Microwave Service and the Common Carrier Fixed Point-to-Point Microwave Service must include the following information:

Applicant's name and address.  
 Transmitting station name.  
 Transmitting station coordinates.  
 Frequencies and polarizations to be added, changed or deleted.  
 Transmitting equipment type, its stability, actual output power, emission designator, and type of modulation (loading).  
 Transmitting antenna type(s), model, gain, and, if required, a radiation pattern provided or certified by the manufacturer.  
 Transmitting antenna center line height(s) above ground level and ground elevation above mean sea level.  
 Receiving station name.  
 Receiving station coordinates.  
 Receiving antenna type(s), model, gain, and, if required, a radiation pattern provided or certified by the manufacturer.

Receiving antenna center line height(s) above ground level and ground elevation above mean sea level.

Path azimuth and distance.

Estimated transmitter transmission line loss expressed in dB.

Estimated receiver transmission line loss expressed in dB.

Note: The position location of antenna sites shall be determined to an accuracy of no less than  $\pm 1$  second in the horizontal dimensions (latitude and longitude) and  $\pm 1$  meter in the vertical dimension (ground elevation) with respect to the National Spatial Reference System.

(f) All applicants for regular authorization must, before filing an application, amendments to a pending application, or modifications to a license, prior coordinate the proposed frequency usage with existing users in the area and other applicants with previously filed applications in accordance with the procedures in § 101.103. In those frequency bands shared with the communication-satellite service, an applicant for a new station, for new points of communication, for the initial frequency assignment in a shared band for which coordination has not been previously effected, or for authority to modify the emission or radiation characteristics of an existing station in a manner that may increase the likelihood of harmful interference, must ascertain in advance whether the station(s) involved lie within the great circle coordination distance contours of an existing Earth station or one for which an application has been accepted for filing, and must coordinate his proposal with each such Earth station operator or applicant. For each potential interference path, the applicant must perform the computations required to determine that the expected level of interference to or from the terrestrial station does not exceed the maximum permissible interference power level in accordance with the technical standards and requirements of §§ 25.251–25.256 of this chapter. The Commission may, in the course of examining any application, require the submission of additional showings, complete with pertinent data and calculations in accordance with part 25 of this chapter, showing that harmful interference will not likely result from the proposed operation. (Technical characteristics of the Earth stations on file and coordination contour maps for those Earth stations will be kept on file for public inspection in the offices of the Commission's International Bureau in Washington, DC)

#### § 101.23 Waiver of rules.

Waivers of these rules may be granted upon application or on the Commission's own motion.

A request for waiver shall contain a statement of reasons sufficient to justify a waiver. A waiver will not be granted except upon an affirmative showing that:

(a) The underlying purpose of the rule will not be served, or would be frustrated, by its application in the particular case, and that grant of the waiver is otherwise in the public interest; or

(b) The unique facts and circumstances of a particular case render application of the rule inequitable, unduly burdensome or otherwise contrary to the public interest. Applicants must also show the lack of a reasonable alternative.

#### § 101.25 Inconsistent or conflicting applications.

While an application is pending and undecided, no subsequent inconsistent or conflicting application may be filed by the same applicant, the applicant's successor or assignee, or on behalf or for the benefit of the same applicant, the applicant's successor or assignee.

#### § 101.27 Repetitious applications.

(a) Where an applicant has been afforded an opportunity for a hearing with respect to a particular application for a new station, or for an extension or enlargement of a 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 the applicant's 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. The Commission may, for good cause shown, waive the requirements of this section.

(b) Where an appeal has been taken from the action of the Commission denying a particular application, another application for the same class of station and for the same area, in whole or in part, filed by the same applicant or by the applicant's 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.

#### § 101.29 Amendment of pending applications.

(a) Any pending application may be amended as a matter of right if the

application has not been designated for hearing, or for comparative evaluation pursuant to § 101.51, or for the random selection process, provided, however, that the amendments must comply with the provisions of § 101.41 as appropriate.

(b) Requests to amend an application designated for hearing or for comparative evaluation, or tentatively selected by the random selection process may be granted only if a written petition demonstrating good cause is submitted and properly served upon the parties of record.

(c) The Commission will classify amendments on a case-by-case basis. Whenever previous amendments have been filed, the most recent amendment will be classified by reference to how the information in question stood as of the latest Public Notice issued which concerned the application. An amendment will be deemed to be a major amendment subject to § 101.37 and § 101.45 under any of the following circumstances:

(1) If the amendment results in a substantial modification of the engineering proposal such as (but not necessarily limited to):

(i) A change in, or an addition of a radio frequency channel;

(ii) A change in polarization of the transmitted signal;

(iii) An increase in the equivalent isotropically radiated power of three (3) dB or more;

(iv) A change in type of transmitter emission or an increase in emission bandwidth of more than ten (10) percent;

(v) A change in the geographic coordinates of a station's transmitting antenna of more than five (5) seconds of latitude or longitude, or both;

(vi) A change of more than one (1) degree in the azimuth of the center of the main lobe of radiation of a point-to-point station's transmitting antenna (including any deflections by repeating devices);

(vii) Any change which increases the antenna center line height by 3.0 meters (ten (10) feet) or more;

(viii) Any changes or combination of changes which would cause harmful electrical interference to an authorized facility or result in a mutually exclusive conflict with another pending application; or

(ix) Any technical change that would increase the effective radiated power in any direction by more than one and one-half (1.5) dB in the Digital Electronic Message Service.

(2) If the amendment would convert a proposal, such that it may have a significant impact upon the

environment under § 1.1307 of this chapter, which would require the submission of an environmental assessment, see § 1.1311 of this chapter, and Commission environmental review, see §§ 1.1308 and 1.1312 of this chapter.

(3) If the amendment results in a substantial and material alteration of the proposed service.

(4) If the amendment specifies a substantial change in beneficial ownership or control (de jure or de facto) of an applicant such that the change would require, in the case of an authorized station, the filing of a prior assignment or transfer of control application under section 310(d) of the Communications Act of 1934 (47 U.S.C. 310(d)). Such a change would not be considered major where the assignment or transfer of control is for legitimate business purposes other than the acquisition of applications.

(5) If the amendment, or the cumulative effect of the amendment, is determined by the Commission otherwise to be substantial pursuant to section 309 of the Communications Act of 1934.

(d) A pending application may be amended by a major amendment to reflect the relocation of a proposed station site and a new application will not be required if:

(1) The geographic coordinates of the new station site are within 32.2 kilometers of the coordinates of the original site; and

(2) The relocated station would serve essentially the same purpose in the system as originally proposed.

(e) The applicant must serve copies of any amendments or other written communications upon the following parties:

(1) Any applicant whose application appears on its face to be mutually exclusive with the application being amended, including those applicants originally served under § 101.509;

(2) Any applicant whose application has been found by the Commission, as published in a public notice, to be mutually exclusive with the application being amended; and

(3) Any party who has filed a petition to deny the application or other formal objection, when that petition or formal objection has not been resolved by the Commission.

(f) The Commission may waive the service requirements of paragraph (e) of this section and prescribe such alternative procedures as may be appropriate under the circumstances to protect petitioners' interests and to avoid undue delay in a proceeding, if an applicant submits a request for waiver which demonstrates that the service

requirement is unreasonably burdensome. Requests for waiver must be served on petitioners. Oppositions to the petition may be filed within five (5) days after the petition is filed and must be served on the applicant. Replies to oppositions will not be entertained.

(g) Any amendment to an application must be signed and must be submitted in the same manner, and with the same number of copies, as was the original application. Amendments may be made in letter form if they comply in all other respects with the requirements of this chapter.

#### **§ 101.31 Special temporary, temporary, and conditional authorizations.**

(a) *Special temporary authorization.*

(1) In circumstances requiring immediate or temporary use of facilities, licensees subject to this part may request special temporary authority to install and/or operate new or modified equipment. Any such request may be submitted as an informal application in the manner set forth in § 101.9 and must contain full particulars as to the proposed operation including all facts sufficient to justify the temporary authority sought and the public interest therein. No such request will be considered unless the request is received by the Commission at least 10 days prior to the date of proposed construction or operation or, where an extension is sought, expiration date of the existing temporary authorization.

(2) Special temporary authorization may be granted upon written request in the following circumstances:

(i) In emergency situations;

(ii) To permit restoration or relocation of existing facilities to continue communication service;

(iii) To conduct tests to determine necessary data for the preparation of an application for regular authorization;

(iv) For a temporary, non-recurring service where a regular authorization is not appropriate;

(v) In other situations involving circumstances which are of such extraordinary nature that delay in the institution of temporary operation would seriously prejudice the public interest.

(3) The Commission may grant requests for special temporary authority without issuing the public notice provided for in § 101.37 for periods not exceeding 180 days, if there are extraordinary circumstances supporting the request and where delay in commencing temporary operation would seriously prejudice the public interest. Requests for special temporary authorization not involving extraordinary circumstances may be

granted without public notice for a period of 30 days where an application for regular operation is not contemplated or for 60 days pending or after the filing of an application for regular operation. Requests for special temporary authority are issued on a strictly secondary, non-interfering basis, and do not in any way affect the final disposition of any application or action pending before the Commission.

(4) Extension of a special temporary authorization for a period of 180 days may be granted, but the renewing applicant bears a heavy burden to show that extraordinary circumstances warrant such an extension.

(5) Request for special temporary authorization must contain the following information:

- (i) Name, address, and citizenship status of the applicant;
- (ii) Need for special action, including a description of any emergency or damage to equipment;
- (iii) Type of operation to be conducted;
- (iv) Purpose of operation;
- (v) Time and date of operation desired;
- (vi) Class of station and nature of service;
- (vii) Location of station and points with which station will communicate;
- (viii) Equipment to be used, specifying manufacturer, model number, and number of units;
- (ix) Frequency(s) desired;
- (x) Azimuth and beamwidth of major lobe of transmitting antenna and ERP;
- (xi) Type of emission;
- (xii) Description of antenna to be used, including height; and
- (xiii) Certification that prior coordination is complete.

(6) In cases of emergency found by the Commission, involving danger to life or property or due to damage of equipment, or during a national emergency proclaimed by the President or declared by the Congress or during the continuance of any war in which the United States is engaged and when such action is necessary for the national defense or safety or otherwise in furtherance of the war effort, or in cases of emergency where the Commission finds that it would not be feasible to secure renewal applications from existing licensees or otherwise to follow normal licensing procedure, the Commission will grant construction permits and station licenses, or modifications or renewals thereof, during the emergency found by the Commission or during the continuance of any such national emergency or war, as special temporary licenses, only for the period of emergency or war,

requiring such action, without the filing of formal applications.

(b) *Temporary authorizations.* (1) Authorizations may be issued upon proper application for rendition of temporary service to subscribers under the following conditions:

(i) When a fixed station, authorized to operate at temporary locations, is to remain at a single location for more than 6 months, an application (FCC Form 402 or 494, as appropriate) for a station authorization designating that single location as the permanent location shall be filed at least 90 days prior to the expiration of the 6-month period;

(ii) The station shall be used only for rendition of communication service at a remote point where the provision of wire facilities is not practicable within the required time frame; and

(iii) The antenna structure height employed at any location shall not exceed the criteria set forth in § 17.7 of this chapter unless, in each instance, authorization for use of a specific maximum antenna structure height for each location has been obtained from the Commission prior to erection of the antenna. See § 101.125.

(2) Applications for authorizations to operate stations at temporary locations under the provisions of this section shall be made upon FCC Form 402 or 494, as appropriate. Blanket applications may be submitted for the required number of transmitters.

(3) The licensee of stations which are authorized pursuant to the provisions of paragraph (b) of this section shall notify the Commission at least five (5) days prior to installation of the facilities, stating:

(i) The call sign, manufacturer's name, type or model number, output power and specific location of the transmitter(s);

(ii) The maintenance location for the transmitter;

(iii) The location of the transmitting or receiving station with which it will communicate and the identity of the correspondent operating such facilities;

(iv) The exact frequency or frequencies to be used;

(v) The public interest, convenience and necessity to be served by operation of the proposed installation;

(vi) The commencement and anticipated termination dates of operation from each location. In the event the actual termination date differs from the previous notification, written notice thereof promptly shall be given to the Commission;

(vii) A notification shall include compliance with the provisions of § 101.21(e) when operations are to be conducted in the area of other terrestrial

microwave stations and with the provisions of § 101.21(e) when operations are to be conducted within the coordination distance contours of a fixed earth station; and

(viii) Where the notification contemplates initially a service which is to be rendered for a period longer than 90 days, the notification shall contain a showing as to why application should not be made for regular authorization.

(4) Less than 5 days advance notice may be given when circumstances require shorter notice provided such notice is promptly given and the reasons in support of such shorter notice are stated.

(5) A copy of the notification shall be kept with the station license.

(c) *Prior coordination.* Stations authorized under this section may complete the prior coordination process orally and the period allowed for response to a coordination notification may be less than 30 days if the parties agree. The requirements under § 101.103(d)(2)(i) for written documentation shall apply to such oral notice.

(d) *Certification.* Any applicant under this section must submit a certification that neither the applicant nor any party to the applicant is subject to a denial of Federal benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1988, as required by § 1.2002 of this chapter.

(e) *Conditional authorization.* (1) An applicant for a new point-to-point microwave radio station(s) or a modification of an existing station(s) in the 3,700–4,200; 5,925–6,425; 6,525–6,875; 10,550–10,680; 10,700–11,700; 11,700–12,200; 12,200–12,700; 12,700–13,200; 13,200–13,250; 17,700–19,700; and 21,200–23,600 MHz bands (see § 101.147 for specific service usage) may operate the proposed station(s) during the pendency of its applications(s) upon the filing of a properly completed formal application(s) that complies with subpart B of part 101 if the applicant certifies that the following conditions are satisfied:

(i) The frequency coordination procedures of § 101.103 have been successfully completed;

(ii) The antenna structure(s) has been previously studied by the Federal Aviation Administration and determined to pose no hazard to aviation safety as required by subpart B of part 17 of this chapter; or the antenna or tower structure does not exceed 6.1 meters above ground level or above an existing man-made structure (other than an antenna structure), if the antenna or tower has not been previously studied

by the Federal Aviation Administration and cleared by the FCC;

(iii) The grant of the application(s) does not require a waiver of the Commission's rules;

(iv) The applicant has determined that the facility(ies) will not significantly affect the environment as defined in § 1.1307 of this chapter;

(v) The station site(s) does not lie within 56.3 kilometers of any international border or within a radio "Quiet Zone" identified in § 101.123, or if operated on frequencies in the 17,700–19,700 MHz band, the station site(s) does not lie within the states of Colorado, Maryland and Virginia and the District of Columbia;

(vi) The filed application(s) does not propose to operate in the 10.6–10.68 GHz band, or in the 21.2–23.6 GHz band with an E.R.P. greater than 55 dBm pursuant to § 101.147(s); and

(vii) The filed application(s) is consistent with the proposal that was coordinated pursuant to § 101.103.

(2) Conditional authority ceases immediately if the application(s) is returned by the Commission because it is not acceptable for filing.

(3) A conditional authorization pursuant to paragraphs (e)(1) and (e)(2) of this section is evidenced by retaining the original executed conditional licensing Certification Form with the station records. Conditional authorization does not prejudice any action the Commission may take on the subject application(s). Conditional authority is accepted with the express understanding that such authority may be modified or cancelled by the Commission at any time without hearing if, in the Commission's discretion, the need for such action arises. An applicant operating pursuant to this conditional authority assumes all risks associated with such operation, the termination or modification of the conditional authority, or the subsequent dismissal or denial of its application(s).

(4) The Certification Form, or a copy thereof, must be posted at each station operating pursuant to this section consistent with § 101.215.

#### § 101.33 Who may sign applications.

See part 1 of this chapter (§§ 1.743 and 1.913), for practices and procedures governing signatures on applications, amendments and related statements of fact.

#### Processing of Applications

#### § 101.35 Preliminary processing of applications.

(a) Applications received for filing are given a file number. The assignment of a file number to an application is for

administrative convenience and does not indicate the acceptance of the application for filing and processing and does not preclude the subsequent return of the application.

(b) Applications that are incomplete with respect to answers, supplementary statements, execution, or other matters of a formal character will be considered defective and may be returned to the applicant with a brief statement as to such defects. If an applicant is requested by the Commission to file any additional documents or information not included in the prescribed application form, failure to comply with such request will be deemed to render the application defective, and such application may be dismissed. Applications will also be deemed to be defective and may be returned to the applicant in the following cases:

(1) Statutory disqualification of applicant;

(2) Proposed use or purpose of station would be unlawful;

(3) Requested frequency is not allocated for assignment for the service proposed;

(4) The submitted filing fee (if required) is insufficient;

(5) The application does not demonstrate compliance with the special requirements applicable to the radio service involved;

(6) The applications do not include all necessary exhibits; or

(7) The application fails to meet any other Commission requirements.

(c) Any application that has been returned to the applicant for correction will be processed in original order of receipt when resubmitted if it is received within 60 days from the date on which it was returned to the applicant and the change does not involve a major amendment. If the application is not resubmitted within the prescribed time, it will be treated as a new application and considered at the time other applications received on the same date are considered.

(d) Applications considered defective under paragraph (b) of this section may be accepted for filing if:

(1) The application is accompanied by a request which sets forth the reasons in support of a waiver of (or an exception to), in whole or in part, any specific rule, regulation, or requirement with which the application is in conflict; or

(2) The Commission, upon its own motion, waives (or allows an exception to), in whole or in part, any rule, regulation or requirement.

#### § 101.37 Public notice period.

(a) At regular intervals, the Commission will issue a public notice listing:

(1) The acceptance for filing of common carrier applications and major amendments thereto;

(2) Significant Commission actions concerning these applications;

(3) The receipt of common carrier applications for minor modifications made pursuant to § 101.59;

(4) Information which the Commission in its discretion believes of public significance; and

(5) Special environmental considerations as required by part 1 of this chapter.

(b) A public notice will not normally be issued for any of the following applications:

(1) For authorization of a minor technical change in the facilities of a proposed or authorized station where such a change would not be classified as a major amendment to a pending application, as defined by § 101.29, or as a minor modification to a license pursuant to § 101.59;

(2) For temporary authorization pursuant to § 101.31;

(3) For an authorization under any of the proviso clauses of section 308(a) of the Communications Act of 1934 (47 U.S.C. 308(a));

(4) For consent to an involuntary assignment or transfer of control of a radio authorization; or

(5) For consent to a voluntary assignment or transfer of control of a radio authorization, where the assignment or transfer does not involve a substantial change in ownership or control.

(c) Except as otherwise provided in this part (e.g., § 101.59), no application that has appeared on public notice will be granted until the expiration of a period of thirty days following the issuance of the public notice listing the application, or any major amendment thereto, or until the expiration of a period of thirty days following the issuance of a public notice identifying the tentative selectee of a random selection process, whichever is later.

(d) The listing of an application on public notice as accepted for filing does not indicate that the application has been found by the Commission to be acceptable for filing and does not preclude the subsequent return of the application.

#### § 101.39 Dismissal and return of applications.

(a) Except as provided under paragraph (c) of this section and under § 101.41, any application may, upon written request, be dismissed without prejudice as a matter of right prior to the adoption date of any final Commission action or the application's designation for hearing or comparative evaluation.

(b) A request to dismiss an application without prejudice will be considered after designation for hearing, after selection through the comparative evaluation procedure of § 101.51, or after selection as a tentative selectee in a random selection proceeding, only if:

(1) A written petition is submitted to the Commission and, in the case of applications designated for hearing or comparative evaluation, is properly served upon all parties of record;

(2) The petition is submitted before the issuance date of a public notice of Commission action denying the application; and

(3) The petition complies with the provision of § 101.41 (whenever applicable) and demonstrates good cause.

(c) Except as provided under § 101.41, an application designated for inclusion in the random selection process may be dismissed without prejudice as a matter of right if the applicant requests its dismissal at least 2 days prior to a random selection proceeding.

(d) Dismissal for failure to prosecute or for failure to respond to official correspondence or requests for additional information within a specified time period will be without prejudice prior to its designation for hearing, or tentative selection by the random selection process. Dismissal may be with prejudice after selection of the comparative evaluation process, or after selection as a tentative selectee in a random selection proceeding.

**§ 101.41 Ownership changes and agreements to amend or dismiss applications or pleadings.**

(a) Except as provided in paragraph (b) of this section, applicants or any other parties in interest to pending applications must comply with the provisions of this section whenever:

(1) They participate in any agreement (or understanding) which involves any consideration promised or received, directly or indirectly, including any agreement (or understanding) for merger of interests or the reciprocal withdrawal of applications; and

(2) The agreement (or understanding) may result in either:

(i) A proposed substantial change in beneficial ownership or control (*de jure* or *de facto*) of an applicant such that the change would require, in the case of an authorized station, the filing of a prior assignment or transfer of control application under section 310(d) of the Communications Act of 1934 (47 U.S.C. 310(d)), or

(ii) Proposed withdrawal, amendment or dismissal of any application(s), amendment(s), petition(s), pleading(s),

or any combination thereof, which would thereby permit the grant without hearing, comparative evaluation under § 101.51, or random selection of an application previously in contested status.

(b) The provisions of this section will not be applicable to any engineering agreement (or understanding) that:

(1) Resolves frequency conflicts with authorized stations or other pending applications without the creation of new or increased frequency conflicts; and

(2) Does not involve any consideration promised or received, directly or indirectly (including any merger of interests or reciprocal withdrawal of applications), other than the mutual benefit of resolving the engineering conflict.

(c) For any agreement subject to this section, the applicant of an application which would remain pending pursuant to such an agreement will be considered responsible for the compliance by all parties with the procedures of this section. Failure of the parties to comply with the procedures of this section will constitute a defect in those applications which are involved in the agreement and remain in a pending status.

(d) The principals to any agreement or understanding subject to this section must comply with the standards of paragraph (e) of this section in accordance with the following procedure:

(1) Within ten (10) days after entering into the agreement, the parties thereto must jointly notify the Commission in writing of the existence and general terms of such agreement, the identity of all of the participants and the applications involved;

(2) Within thirty (30) days after entering into the agreement, the parties thereto must file any proposed application amendments, motions, or requests together with a copy of the agreement which clearly sets forth all terms and provisions, and such other facts and information as necessary to satisfy the standards of paragraph (e) of this section. Such submission must be accompanied by the certification by affidavit of each principal to the agreement declaring that the statements made are true, complete, and correct to the best of their knowledge and belief, and are made in good faith; and

(3) The Commission may request any further information which in its judgment it believes is necessary for a determination under paragraph (e) of this section.

(e) The Commission will grant an application (or applications) involved in the agreement (or understanding) only if it finds upon examination of the

information submitted, and upon consideration of such other matters as may be officially noticed, that the agreement is consistent with the public interest, and the amount of any monetary consideration and the cash value of any other consideration promised or received is not in excess of those legitimate and prudent costs directly assignable to the engineering, preparation, filing and advocacy of the withdrawn, dismissed, or amended application(s), amendment(s), petition(s), pleading(s), or any combination thereof. Where such costs represent the applicant's in-house efforts, these costs may include only directly assignable costs and must exclude general overhead expenses. (The treatment to be accorded such consideration for interstate rate making purposes will be determined at such time as the question may arise in an appropriate rate proceeding.) An itemized accounting must be submitted to support the amount of consideration involved except where such consideration (including the fair market value of any non-cash consideration) promised or received does not exceed one thousand dollars (\$1,000.00). Where consideration involves a sale of facilities or merger of interests, the accounting must clearly identify that portion of the consideration allocated for such facilities or interests and a detailed description thereof, including estimated fair market value. The Commission will not presume an agreement (or understanding) to be prima facie contrary to the public interest solely because it incorporates a mutual agreement to withdraw pending application(s), amendment(s), petition(s), pleading(s), or any combination thereof.

**§ 101.43 Opposition to applications.**

(a) Any party in interest may file with the Commission a petition to deny any application for which public notice is required. All such petitions must:

(1) Identify the application or applications including applicant's name, station location, Commission file numbers and radio service involved with which it is concerned;

(2) Be filed in accordance with the pleading limitations, filing periods, and other applicable provisions of this part and part 1 of this chapter;

(3) Contain specific allegations of fact (except for those of which official notice may be taken), supported by affidavit of a person or persons with personal knowledge thereof and be sufficient to make a prima facie showing that the petitioner is a party in interest and that a grant of the application would be

inconsistent with the public interest, convenience and necessity;

(4) Be filed within thirty (30) days after the date of public notice announcing the acceptance for filing of such applications or major amendments thereto, or, identifying the tentative selectee of a random selection proceeding (unless the Commission otherwise extends the deadline); and

(5) Contain a certificate of service showing that the applicant has been mailed a copy of the petition no later than the date on which the petition is filed with the Commission.

(b) The applicant may file an opposition to any petition to deny and the petitioner may file a reply thereto in which allegations of fact or denials thereof must be supported by an affidavit of a person or persons with personal knowledge thereof and be clearly identified. The applicant must serve a copy of the opposition on the petitioner, and the petitioner must serve a copy of its reply on the applicant. The time for filing such oppositions and replies are provided in § 1.45 of this chapter.

(c) Notwithstanding the provisions of paragraph (a) of this section, before Commission action on any application for an instrument of authorization, any person may file informal objections to the grant. The Commission will consider informal objections, but not necessarily discuss them in a written opinion, if the objection is filed at least one day prior to action on the application and the objection is signed by the submitting person with a disclosure of that person's interest. Such objections may be submitted in letter form. The limitation on pleadings and time for filing pleadings provided for in § 1.45 of this chapter will not be applicable to any objections duly filed pursuant to this paragraph.

(d) Petitions to deny not filed in accordance with paragraph (a) of this section will be treated as informal objections.

#### **§ 101.45 Mutually exclusive applications.**

(a) The Commission will consider applications to be mutually exclusive if their conflicts are such that the grant of one application would effectively preclude by reason of harmful electrical interference, or other practical reason, the grant of one or more of the other applications. The Commission will presume "harmful electrical interference" exists when the levels of § 101.105 are exceeded, or when there is a material impairment to service rendered to the public despite full cooperation in good faith by all applicants or parties to achieve

reasonable technical adjustments which would avoid electrical conflict.

(b) A common carrier application will be entitled to be included in a random selection process or to comparative consideration with one or more conflicting applications only if:

(1) The application is mutually exclusive with the other application; and

(2) The application is received by the Commission in a condition acceptable for filing by whichever "cut-off" date is earlier:

(i) Sixty (60) days after the date of the public notice listing the first of the conflicting applications as accepted for filing; or

(ii) One (1) business day preceding the day on which the Commission takes final action on the previously filed application (should the Commission act upon such application in the interval between thirty (30) and sixty (60) days after the date of its public notice).

(c) Whenever three or more applications are mutually exclusive, but not uniformly so, the earliest filed application established the date prescribed in paragraph (b)(2) of this section, regardless of whether or not subsequently filed applications are directly mutually exclusive with the first filed application. (For example, applications A, B, and C are filed in that order. A and B are directly mutually exclusive, B and C are directly mutually exclusive. In order to be considered comparatively with B, C must be filed within the "cut-off" period established by A even though C is not directly mutually exclusive with A.)

(d) Private operational fixed point-to-point microwave applications for authorization under this part will be entitled to be included in a random selection process or to comparative consideration with one or more conflicting applications in accordance with the provisions of § 1.227(b)(4) of this chapter.

(e) An application otherwise mutually exclusive with one or more previously filed applications, but filed after the appropriate date prescribed in paragraphs (b) or (d) of this section, will be returned without prejudice and will be eligible for refiling only after final action is taken by the Commission with respect to the previously filed application (or applications).

(f) For the purposes of this section, any application (whether mutually exclusive or not) will be considered to be a newly filed application if it is amended by a major amendment (as defined by § 101.29), except under any of the following circumstances:

(1) The application has been designated for comparative hearing, or for comparative evaluation (pursuant to § 101.51), and the Commission or the presiding officer accepts the amendment pursuant to § 101.29(b);

(2) The amendment resolves frequency conflicts with authorized stations or other pending applications which would otherwise require resolution by hearing, by comparative evaluation pursuant to § 101.51, or by random selection pursuant to § 101.49 provided that the amendment does not create new or additional frequency conflicts;

(3) The amendment reflects only a change in ownership or control found by the Commission to be in the public interest, and for which a requested exemption from the "cut-off" requirements of this section is granted;

(4) The amendment reflects only a change in ownership or control which results from an agreement under § 101.41 whereby two or more applicants entitled to comparative consideration of their applications join in one (or more) of the existing applications and request dismissal of their other application (or applications) to avoid the delay and cost of comparative consideration;

(5) The amendment corrects typographical, transcription, or similar clerical errors which are clearly demonstrated to be mistakes by reference to other parts of the application, and whose discovery does not create new or increased frequency conflicts; or

(6) The amendment does not create new or increased frequency conflicts, and is demonstrably necessitated by events which the applicant could not have reasonably foreseen at the time of filing, such as, for example:

(i) The loss of a transmitter or receiver site by condemnation, natural causes, or loss of lease or option;

(ii) Obstruction of a proposed transmission path caused by the erection of a new building or other structure; or

(iii) The discontinuance or substantial technological obsolescence of specified equipment, whenever the application has been pending before the Commission for two or more years from the date of its filing.

(g) Applicants for the 932.5–935/941.5–944 MHz bands shall select a frequency pair. Applicants for these bands may select an unpaired frequency only upon a showing that spectrum efficiency will not be impaired and that unpaired spectrum is not available in other bands. During the initial filing window, frequency coordination is not

required, except that an application for a frequency in the 942–944 MHz band must be coordinated to ensure that it does not affect an existing broadcast auxiliary service licensee. After the initial filing window, an applicant must submit evidence that frequency coordination has been performed with all licensees affected by the application. All frequency coordination must be performed in accordance with § 101.103. In the event of mutually exclusive applications occurring during the initial filing window for the 932.5–935/941.5–944 MHz bands, applicants shall be given the opportunity to resolve these situations by applying for an alternative frequency pair, if one is available. To the extent that there are no other available frequencies or to the extent that mutually exclusive applications remain after this process is concluded, lotteries shall be conducted for each frequency pair among all remaining mutually exclusive applications, assuming appropriate coordination with existing broadcast auxiliary stations can be concluded, where necessary. In the event of mutually exclusive applications being received for these bands on the same day after the initial filing window has closed and a subsequent filing window opened, lotteries shall be conducted for each frequency pair among all mutually exclusive applications.

**§ 101.47 Consideration of applications.**

(a) Applications for an instrument of authorization will be granted if, upon examination of the application and upon consideration of such other matters as it may officially notice, the Commission finds that the grant will serve the public interest, convenience, and necessity.

(b) The grant will be without a formal hearing if, upon consideration of the application, any pleadings of objections filed, or other matters which may be officially noticed, the Commission finds that:

(1) The application is acceptable for filing, and is in accordance with the Commission's rules, regulations, and other requirements;

(2) The application is not subject to comparative consideration (pursuant to § 101.45) with another application (or applications), except where the competing applicants have chosen the comparative evaluation procedure of § 101.51 and a grant is appropriate under that procedure;

(3) A grant of the application would not cause harmful electrical interference to an authorized station;

(4) There are no substantial and material questions of fact presented; and

(5) The applicant is legally, technically, financially and otherwise qualified, and a grant of the application would serve the public interest.

(c) Whenever the Commission, without a formal hearing, grants any application in part, or subject to any terms or conditions other than those normally applied to applications of the same type, it will inform the applicant of the reasons therefor, and the grant will be considered final unless the Commission revises its action (either by granting the application as originally requested, or by designating the application for a formal evidentiary hearing) in response to a petition for reconsideration that:

(1) Is filed by the applicant within thirty (30) days from the date of the letter or order giving the reasons for the partial or conditioned grant;

(2) Rejects the grant as made and explains the reasons why the application should be granted as originally requested; and

(3) Returns the instrument of authorization.

(d) The Commission will designate an application for a formal hearing, specifying with particularity the matters and things in issue, if, upon consideration of the application, any pleadings or objections filed, or other matters which may be officially noticed, the Commission determines that:

(1) A substantial and material question of fact is presented;

(2) The Commission is unable for any reason to make the findings specified in paragraph (a) of this section and the application is acceptable for filing, complete, and in accordance with the Commission's rules, regulations, and other requirements;

(3) The application is entitled to comparative consideration (under § 101.45) with another application (or applications); or

(4) The application is entitled to comparative consideration (pursuant to § 101.45) and the applicants have chosen the comparative evaluation procedure of § 101.51 but the Commission deems such procedure to be inappropriate.

(e) The Commission may grant, deny, or take other action with respect to an application designated for a formal hearing pursuant to paragraph (d) of this section or part 1 of this chapter.

(f) Whenever the public interest would be served thereby the Commission may grant one or more mutually exclusive applications expressly conditioned upon final action on the applications, and then either conduct a random section process (in specified services under this rules part),

designate all of the mutually exclusive applications for a formal evidentiary hearing or (whenever so requested) follow the comparative evaluation procedures of § 101.51, as appropriate, if it appears:

(1) 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;

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

(3) That a delay in making a grant to any applicant until after the conclusion of a hearing or a random selection proceeding on all applications might jeopardize the rights of the United States under the provision of an international agreement to the use of the frequency in question; or

(4) That a grant of one application would be in the public interest in 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, other statutes, or of the provisions of this chapter.

(g) Reconsideration or review of any final action taken by the Commission will be in accordance with subpart A of part 1 of this chapter.

**§ 101.49 Grants by random selection.**

(a) If an application for an authorization in the Digital Electronic Message Service (DEMS) is mutually exclusive with another such application and satisfies the requirements of § 101.45, the applicant may be included in the random selection process set forth in §§ 1.821, 1.822 and 1.825 of this chapter.

(b) Renewal applications will not be included in a random selection process.

**§ 101.51 Comparative evaluation of mutually exclusive applications.**

(a) In order to expedite action on mutually exclusive applications in services under this rules part where the random selection process does not apply, the applicants may request the Commission to consider their applications without a formal hearing in accordance with the summary procedure outlined in paragraph (b) in this section if:

(1) The applications are entitled to comparative consideration pursuant to § 101.45;

(2) The applications have not been designated for formal evidentiary hearing; and

(3) The Commission determines, initially or at any time during the

procedure outlined in paragraph (b) of this section, that such procedure is appropriate, and that, from the information submitted and consideration of such other matters as may be officially noticed, there are no substantial and material questions of fact presented (other than those relating to the comparative merits of the applications) which would preclude a grant under paragraphs (a) and (b) of § 101.47.

(b) Provided that the conditions of paragraph (a) of this section are satisfied, applicants may request the Commission to act upon their mutually exclusive applications without a formal hearing pursuant to the summary procedure outlined below:

(1) To initiate the procedure, each applicant will submit to the Commission a written statement containing:

(i) A waiver of the applicant's right to a formal hearing;

(ii) A request and agreement that, in order to avoid the delay and expense of a comparative formal hearing, the Commission should exercise its judgment to select from among the mutually exclusive applications that proposal (or proposals) which would best serve the public interest; and

(iii) The signature of a principal (and the principal's attorney if represented).

(2) After receipt of the written requests of all of the applicants the Commission (if it deems this procedure appropriate) will issue a notice designating the comparative criteria upon which the applications are to be evaluated and will request each applicant to submit, within a specified period of time, additional information concerning the applicant's proposal relative to the comparative criteria.

(3) Within thirty (30) days following the due date for filing this information, the Commission will accept concise and factual argument on the competing proposals from the rival applicants, potential customers, and other knowledgeable parties in interest.

(4) Within fifteen (15) days following the due date for the filing of comments, the Commission will accept concise and factual replies from the rival applicants.

(5) From time to time during the course of this procedure the Commission may request additional information from the applicants and hold informal conferences at which all competing applicants will have the right to be represented.

(6) Upon evaluation of the applications, the information submitted, and such other matters as may be officially noticed the Commission will issue a decision granting one (or more)

of the proposals which it concludes would best serve the public interest, convenience and necessity. The decision will report briefly and concisely the reasons for the Commission's selection and will deny the other application(s). This decision will be considered final.

License Transfers, Modifications, Conditions and Forfeitures

**§ 101.53 Assignment or transfer of station authorization.**

(a) No station license, or any rights thereunder, may be transferred, assigned, or disposed of in any manner, voluntarily or involuntarily, directly or indirectly, or by transfer of control of any corporation or any other entity holding any such license, to any person except upon application to the Commission and upon finding by the Commission that the public interest, convenience and necessity will be served thereby.

(b) For purposes of this section, transfers of control requiring Commission approval must include any and all transactions that:

(1) Change the party controlling the affairs of the licensee; or

(2) Affect any change in a controlling interest in the ownership of the licensee, including changes in legal or equitable ownership.

(c) Requests for transfer of control or assignment authority must be submitted on the application form prescribed by § 101.13 or § 101.15, and must be accompanied by the applicable showings required by §§ 101.19, 101.21, and 101.55.

(d) The Commission must be promptly notified in writing when a licensee is voluntarily or involuntarily placed in bankruptcy or receivership and when an individual licensee, a member of a partnership which is a licensee, or a person directly or indirectly in control of a corporation which is a licensee, dies or becomes legally disabled. Within thirty days after the occurrence of such bankruptcy, receivership, death or legal disability, an application of involuntary assignment of such license, or involuntary transfer of control of such corporation, must be filed with the Commission, requesting assignment or transfer to a successor legally qualified under the laws of the place having jurisdiction over the assets involved.

(e) The assignor of a station licensed under this part may retain no right of reversion or reassignment of the license and may not reserve the right to use the facilities of the station for any period whatsoever. No assignment of license

will be granted or authorized if there is a contract or understanding, express or implied, pursuant to which a right of reversion or reassignment of the license or right to use the facilities are retained as partial or full consideration for the assignment or transfer.

(f) No special temporary authority, or any rights thereunder, may be assigned or otherwise disposed of, directly or indirectly, voluntarily or involuntarily, without prior Commission approval.

**§ 101.55 Considerations involving transfer or assignment applications.**

(a) Licenses may not be assigned or transferred prior to the completion of construction of the facility. However, consent to the assignment or transfer of control of such a license may be given prior to the completion of construction where:

(1) The assignment or transfer does not involve a substantial change in or ownership or control of the authorized facilities; or

(2) The assignment or transfer of control is involuntary due to the licensee's bankruptcy, death, or legal disability.

(b) The Commission will review a proposed transaction to determine if the circumstances indicate "trafficking" in licenses whenever applications (except those involving pro forma assignment or transfer of control) for consent to assignment of a license, or for transfer of control of a licensee, involve facilities:

(1) Authorized following a comparative hearing and have been operated less than one year;

(2) Involve facilities that have not been constructed; or

(3) Involve facilities that were authorized following a random selection proceeding in which the successful applicant received preference and that have been operated for less than one year.

(c) At its discretion, the Commission may require the submission of an affirmative, factual showing (supported by affidavits of a person or persons with personal knowledge thereof) to demonstrate that the proposed assignor or transferor has not acquired an authorization or operated a station for the principal purpose of profitable sale rather than public service. This showing may include, for example, a demonstration that the proposed assignment or transfer is due to changed circumstances (described in detail) affecting the licensee subsequent to the acquisition of the license, or that the proposed transfer of radio facilities is incidental to a sale of other facilities or merger of interests.

(d) If a proposed transfer of radio facilities is incidental to a sale or other facilities or merger of interests, any showing requested under paragraph (a) of this section must include an additional exhibit that:

(1) Discloses complete details as to the sale of facilities or merger of interests;

(2) Segregates clearly by an itemized accounting, the amount of consideration involved in the sale of facilities or merger of interests; and

(3) Demonstrates that the amount of consideration assignable to the facilities or business interests involved represents their fair market value at the time of the transaction.

(e) For the purposes of this section, the one year period is calculated using the following dates (as appropriate):

(1) The initial date of grant of the license, excluding subsequent modifications;

(2) The date of consummation of an assignment or transfer, if the station is acquired as the result of an assignment of license, or transfer of control of corporate licensee; or

(3) The median date of the applicable commencement dates (determined pursuant to paragraphs (d)(1) and (2) of this section) if the transaction involves a system (such as a Private Operational Fixed Point-to-Point Microwave system) of two or more stations. (The median date is that date so selected such that fifty percent of the commencement dates of the total number of stations, when arranged in chronological order, lie below it and fifty percent lie above it. When the number of stations is an even number, the median date will be a value half way between the two dates closest to the theoretical median).

#### **§ 101.57 Modification of station license.**

(a) Except as provided in § 101.59, no modification of a license issued pursuant to this part (or the facilities described thereunder) may be made except upon application to the Commission.

(b) No application for modification to extend a license construction period will be granted for delays caused by lack of financing or for lack of site availability. Applications for time extensions for other reasons must include a verified statement from the applicant showing that the licensee has made diligent efforts to construct the facilities and:

(1) That additional time is required due to circumstances beyond the applicant's control, in which case the applicant must describe such circumstances and must set forth with

specificity and justify the precise extension period requested; or

(2) That there are unique and overriding public interest concerns that justify such an extension, in which case the applicant must identify such interests and must set forth and justify a precise extension period.

(c) Notwithstanding the provisions of paragraph (b) of this section, when a station license has been assigned or transferred pursuant to § 101.53, any extension of time will be limited so that the time left to construct after Commission grant of the transfer or assignment will be no more than the time remaining for construction at the date of the filing of the application for transfer or assignment.

(d) Modification of license is required for the following changes in authorized stations:

(1) Any change in frequencies used;

(2) Any change in antenna azimuth;

(3) Any change in antenna

beamwidth;

(4) Any change in antenna or passive repeater location greater than 1 second or which involves a requirement for special aeronautical study;

(5) Any change in antenna polarization;

(6) Any change in antenna height;

(7) Any change in the size of passive reflectors or repeaters associated with the facilities of an authorized station;

(8) Any increase in emission bandwidth beyond that authorized;

(9) Any change in the type of emission;

(10) Any change in authorized equivalent isotropically radiated power in excess of 3 dB (a 2-to-1 ratio); or

(11) Substitution of equipment having a greater frequency tolerance.

(e) When the name of the licensee is changed (without changes in the ownership, control, or corporate structure), or when the mailing address is changed (without changing the authorized location of the fixed station) a formal application for modification of license is not required. However, the licensee must notify the Commission within thirty days of the effective date of these changes. The notice, which may be in letter form, must contain the name and address of the licensee as they appear in the Commission's records, the new name or address, the call signs and classes of all radio stations authorized to the licensee under this part and the radio service in which each station is authorized. The notice must be sent to the Federal Communications Commission, Gettysburg, PA 17325 and a copy must be maintained with the license of each station until a new license is issued.

#### **§ 101.59 Processing of applications for facility minor modifications.**

(a) Unless an applicant is notified to the contrary by the Commission, as of the twenty-first day following the date of public notice, any application that meets the requirements of paragraph (b) of this section and proposes only the change specified in paragraph (c) of this section will be deemed to have been authorized by the Commission.

(b) An application may be considered under the procedures of this section only if:

(1) It is in the Private Operational Fixed Point-to-Point Microwave, Common Carrier Fixed Point-to-Point Microwave, Local Television Transmission, or Digital Electronic Message Services;

(2) The cumulative effect of all such applications made within any 60 day period does not exceed the appropriate values prescribed by paragraph (c) of this section;

(3) The facilities to be modified are not located within 56.3 kilometers (35 miles) of the Canadian or Mexican border;

(4) It is acceptable for filing, is consistent with all of the Commission's rules, and does not involve a waiver request;

(5) It specifically requests consideration pursuant to this section; and

(6) Written notice of such filing has been provided to all parties otherwise required to be provided a prior coordination notice in accordance with § 101.103(d) or, in the Digital Electronic Message Services, a copy of the application has been served on those who also were served under § 101.509.

(c) The modifications that may be authorized under the procedures of this section are:

(1) Changes in a transmitter and existing transmitter operating characteristics, or protective configuration of transmitter, provided that:

(i) In all radio services other than Digital Electronic Message Service, any increase in equivalent isotropically radiated power is less than 3 dB over the previously authorized output power, and in Digital Electronic Message Service, any increase in equivalent isotropically radiated power is 1.5 dB or less over the previously authorized equivalent isotropically radiated power;

(ii) The necessary bandwidth is not increased beyond the previously authorized bandwidth;

(2) Changes in the center line height of an antenna, provided that:

(i) In all radio services except the Digital Electronic Message Service, any

increase in antenna height is less than 3.0 meters (10 feet) above the previously authorized height;

(ii) In the Digital Electronic Message Service, any increase in antenna height is less than 3.0 meters (10 feet) above the previously authorized height; and

(iii) The overall height of the antenna structure is not increased as a result of the antenna extending above the height of the previously authorized structure, except when the new height of the antenna structure is 6.1 meters (20 feet) or less (above ground or man-made structure, as appropriate) after the change is made.

(3) Change in the geographical coordinates of a transmit station, receive station or passive facility by five (5) seconds or less of latitude, longitude or both, provided that when notice to the FAA of proposed construction is required by part 17 of this chapter for antenna structure at the previously authorized coordinates (or will be required at the new location) the applicant must comply with the provisions of § 101.21(a).

(d) Upon grant of an application under the procedure of this section and at such time that construction begins, the applicant must keep a complete copy of the application (including the filing date) with the station license if construction begins prior to receipt of the authorization.

**§ 101.61 Certain modifications not requiring prior authorization.**

(a) Equipment in an authorized radio station may be replaced without prior authorization or notification if the replacement equipment is equivalent to the replaced equipment.

(b) Licensees of fixed stations in the Private Operational Fixed Point-to-Point Microwave, Common Carrier Fixed Point-to-Point Microwave, Local Television Transmission, or Digital Electronic Message Services, may make the facility changes listed in paragraph (c) of this section without obtaining prior Commission authorization, if:

(1) Frequency coordination procedures, as necessary, are complied with in accordance with § 101.103(d) or, in the Digital Electronic Message Services, a copy of the notification described in paragraph (b)(3) of this section is served on those who were served under § 101.509; and

(2) The cumulative effect of all facility changes made within any 60 day period does not exceed the appropriate values prescribed by paragraph (c) of this section; and

(3) The Commission is notified of changes made to facilities by the submission of a completed FCC Form

494 within thirty days after the changes are made.

(c) Modifications that may be made without prior authorization under paragraph (b) of this section are:

(1) Change or modification of a transmitter, when:

(i) The replacement or modified transmitter is type-accepted (or type-notified) for use under this part and is installed without modification from the type-accepted (or type notified) configuration;

(ii) The type of modulation is not changed;

(iii) The frequency stability is equal to or better than the previously authorized frequency stability; and

(iv) The necessary bandwidth and the output power do not exceed the previously authorized values.

(2) Addition or deletion of a transmitter for protection without changing the authorized power output (e.g. hot standby transmitters);

(3) Change to an antenna (other than any change involving a periscope antenna system), when:

(i) For the Private Operational Fixed Point-to-Point Microwave, Common Carrier Fixed Point-to-Point Microwave, and Local Television Transmission Services, the new antenna conforms to the requirements of § 101.115 and has essentially the same or better radiation characteristics than the previously authorized antenna;

(ii) For the Digital Electronic Message Service, the new antenna conforms with § 101.517 and the gain of the new antenna does not exceed that of the previously authorized antenna by more than one dB in any direction.

(4) Any technical changes that would decrease the effective radiated power.

(5) Change to the height of an antenna system, when:

(i) The new center line height (measured at the center-of-radiation) is within  $\pm 1.5$  meters of the previously authorized height; and

(ii) The overall height of the antenna structure is not increased as a result of the antenna extending above the height of the previously authorized structure, except when the new height of the antenna structure is 6.1 meters or less (above ground or man-made structure, as appropriate) after the change is made.

(6) Decreases in the overall height of an antenna structure, provided that, when notice to the FAA of proposed construction was required by part 17 of this chapter for the antenna structure at the previously authorized height, the applicant must comply with the provisions of § 101.21(a).

(7) Changes in the azimuth of the center of the main lobe of radiation of

a point-to-point station's antenna by a maximum of one degree.

(8) Changes to the transmission line and other devices between the transmitter and the antenna when the effective radiated power of the station is not increased by more than one dB.

(d) Licensees may notify the Commission of permissible changes or correct erroneous information on a license not involving a major change (i.e., a change that would be classified as a major amendment as defined by § 101.29) without obtaining prior Commission approval by filing FCC Form 494.

**§ 101.63 Period of construction; certification of completion of construction.**

(a) Each station authorized under this part must be in operation within 18 months from the initial date of grant. Modification of an operational station must be completed within 18 months of the date of grant of the applicable modification request.

(b) Failure to timely begin operation means the authorization cancels automatically and must be returned to the Commission.

(c) The frequencies associated with all point-to-multipoint authorizations which have cancelled automatically or otherwise been recovered by the Commission will again be made available for reassignment on a date and under terms set forth by Public Notice.

(d) Requests for extension of time to be in operation may be granted upon a showing of good cause, setting forth in detail the applicant's reasons for failure to have the facility operating in the prescribed period. Such requests must be submitted no later than 30 days prior to the end of the prescribed period to the Federal Communications Commission, Gettysburg, PA 17325-7245.

(e) Construction of any station must be completed by the date specified in the license as the termination date of the construction period. Licensees who fail to complete construction must return their authorization for cancellation within 5 days after the expiration of the construction period specified on the license.

**§ 101.65 Forfeiture and termination of station authorizations.**

(a) A license will be automatically forfeited in whole or in part without further notice to the licensee upon:

(1) The expiration of the construction period specified therein, or after such additional time as may be authorized by the Commission;

(2) The expiration of the license period specified therein, unless prior

thereto an application for renewal of such license has been filed with the Commission; or

(3) The voluntary removal or alteration of the facilities, so as to render the station not operational for a period of 30 days or more.

(b) A license forfeited in whole or in part under the provisions of paragraph (a)(1) or (a)(2) of this section may be reinstated if the Commission, in its discretion, determines that reinstatement would best serve the public interest, convenience and necessity. Petitions for reinstatement filed pursuant to this subsection will be considered only if:

(1) The petition is filed within 30 days of the expiration date set forth in paragraph (a)(1) or (a)(2) of this section, whichever is applicable;

(2) The petition explains the failure to timely file such notification or application as would have prevented automatic forfeiture; and

(3) The petition sets forth with specificity the procedures which have been established to insure timely filings in the future.

(c) A special temporary authorization will automatically terminate upon the expiration date specified therein, or upon failure to comply with any special terms or conditions set forth therein. Operation may be extended beyond such termination date only after application and upon specific authorization by the Commission.

(d) If a station licensed under this part discontinues operation on a permanent basis, the licensee must forward the station license to the Federal Communications Commission, Gettysburg, Pennsylvania 17325, for cancellation. For purposes of this section, any station which has not operated for one year or more is considered to have been permanently discontinued. See § 101.305 for additional rules regarding temporary and permanent discontinuation of service.

#### § 101.67 License period.

Licenses for stations authorized under this part will be issued for a period not to exceed 10 years. Unless otherwise specified by the Commission, the expiration of regular licenses shall be on the date (month and day) selected by licensees in the year of expiration.

#### § 101.69 Transition of the 2.11–2.13, and 2.16–2.18 GHz bands from the Common Carrier Fixed Point-to-Point Microwave Services and the 1.85–1.99, 2.13–2.15, and 2.18–2.20 GHz bands from the Private Operational Fixed Point-to-Point Microwave Service to emerging technologies.

(a) Licensees proposing to implement services using emerging technologies (ET Licensees) may negotiate with Common Carrier and Private Operational Fixed Point-to-Point Microwave Service licensees (Existing Licensees) in these bands for the purpose of agreeing to terms under which the Existing Licensees would relocate their operations to other fixed microwave bands or to other media, or alternatively, would accept a sharing arrangement with the ET Licensee that may result in an otherwise impermissible level of interference to the existing licensee's operations. ET Licensees may also negotiate agreements for relocation of the Existing Licensees' facilities within the 2 GHz band in which all interested parties agree to the relocation of the Existing Licensee's facilities elsewhere within these bands. "All interested parties" includes the incumbent licensee, the emerging technology provider or representative requesting and paying for the relocation, and any emerging technology licensee of the spectrum to which the incumbent's facilities are to be relocated.

(b) Common Carrier and Private Operational Fixed Point-to-Point Microwave Service licensees, with the exception of public safety facilities defined in paragraph (f) of this section, in bands allocated for licensed emerging technology services will maintain primary status in these bands until two years after the Commission commences acceptance of applications for an emerging technology service (two-year voluntary negotiation period), and until one year after an emerging technology service licensee initiates negotiations for relocation of the fixed microwave licensee's operations (one-year mandatory negotiation period) or, in bands allocated for unlicensed emerging technology services, until one year after an emerging technology unlicensed equipment supplier or representative initiates negotiations for relocation of the fixed microwave licensee's operations (one-year mandatory negotiation period). When it is necessary for an emerging technology provider or representative of unlicensed device manufacturers to negotiate with a fixed microwave licensee with operations in spectrum adjacent to that of the emerging technology provider, the transition schedule of the entity requesting the move will apply. Public

safety facilities defined in paragraph (f) of this section will maintain primary status in these bands until three years after the Commission commences acceptance of applications for an emerging technology service (three-year voluntary negotiation period), and until two years after an emerging technology service licensee or an emerging technology unlicensed equipment supplier or representative initiates negotiations for relocation of the fixed microwave licensee's operations (two-year mandatory negotiation period).

(c) The Commission will amend the operation license of the Common Carrier and Private Operational Fixed Point-to-Point Microwave Service operator to secondary status only if the following requirements are met:

(1) The service applicant, provider, licensee, or representative using an emerging technology guarantees payment of all relocation costs, including all engineering, equipment, site and FCC fees, as well as any reasonable, additional costs that the relocated fixed microwave licensee might incur as a result of operation in another fixed microwave band or migration to another medium;

(2) The emerging technology service entity completes all activities necessary for implementing the replacement facilities, including engineering and cost analysis of the relocation procedure and, if radio facilities are used, identifying and obtaining, on the incumbents' behalf, new microwave frequencies and frequency coordination; and

(3) The emerging technology service entity builds the replacement system and tests it for comparability with the existing 2 GHz system.

(d) The 2 GHz microwave licensee is not required to relocate until the alternative facilities are available to it for a reasonable time to make adjustments, determine comparability, and ensure a seamless handoff.

(e) If within one year after the relocation to new facilities the 2 GHz microwave licensee demonstrates that the new facilities are not comparable to the former facilities, the emerging technology service entity must remedy the defects or pay to relocate the microwave licensee back to its former or equivalent 2 GHz frequencies.

(f) Public safety facilities subject to the three-year voluntary and two-year mandatory negotiation periods, are those that the majority of communications carried are used for police, fire, or emergency medical services operations involving safety of life and property. The facilities within this exception are those facilities

currently licensed on a primary basis pursuant to the eligibility requirements of § 90.19 of this chapter, Police Radio Service; § 90.21 of this chapter, Fire Radio Service; § 90.27 of this chapter Emergency Medical Radio Service; and subpart C of part 90 of this chapter,

Special Emergency Radio Services. Licensees of other part 101 facilities licensed on a primary basis under the eligibility requirements of subparts B and C, part 90 of this chapter, are permitted to request similar treatment upon demonstrating that the majority of

the communications carried on those facilities are used for operations involving safety of life and property.

**Subpart C—Technical Standards**

**§ 101.101 Frequency availability.**

Frequency band (MHz)	Radio service				Notes
	Common carrier (Part 101)	Private radio (Part 101)	Broadcast auxiliary (Part 74)	Other (Parts 15, 21, 24, 25, 74, 78 & 100)	
928–929		MAS			
932.0–932.5	MAS	MAS			(1)
932.5–935.0	CC	OFS			(1)
941.0–941.5	MAS	MAS			(1)
941.5–944.0	CC	OFS	Aural BAS		(1)
952–960		OFS/MAS			
1850–1990		OFS		PCS	
2110–2130	CC			PET	
72130–2150		OFS		PET	
2150–2160		OFS		MDS	
2160–2180	CC			ET	
2180–2200		OFS		PET	
2450–2500	LTTS	OFS	TV BAS	ISM	F/M/TF
2650–2690		OFS		MDS/ITFS	
3700–4200	CC LTTS	OFS		SAT	
5925–6425	CC LTTS	OFS		SAT	
6425–6525	LTTS	OFS	TV BAS	CARS	M
6525–6875	CC	OFS			F/TF
10,550–10,680	CC DEMS	OFS, DEMS			
10,700–11,700	CC LTTS	OFS		SAT	
11,700–12,200	LTTS			SAT	
12,200–12,700		OFS		DBS	
12,700–13,250	CC LTTS	OFS	TV BAS	CARS	F/M/TF
14,200–14,400	LTTS			SAT	
17,700–18,580	CC	OFS	TV BAS	SAT CARS	
18,580–18,820	CC	OFS	Aural BAS	SAT	
18,820–18,920	DEMS	OFS DEMS		SAT	
18,920–19,160	CC	OFS	Aural BAS	SAT	
19,160–19,260	DEMS	OFS DEMS		SAT	
19,260–19,700	CC	OFS	TV BAS	CARS SAT	
21,200–23,600	CC LTTS	OFS			TF
27,500–29,500	CC			SAT	
31,000–31,300	CC LTTS	OFS	TV BASCARS	F/M/TF	
38,600–40,000	CC	OFS	TV BAS		F/M/TF

BAS: Broadcast Auxiliary Service—(Part 74).  
 CARS: Cable Television Relay Service —(Part 78).  
 CC: Common Carrier Fixed Point-to-Point Microwave Service—(Part 101, Subparts C & I).  
 DBS: Direct Broadcast Satellite—(Part 100).  
 DEMS: Digital Electronic Message Service—(Part 101, Subpart G).  
 ET: Emerging Technologies (per ET Dkt. No. 92–9, not yet assigned).  
 ISM: Industrial, Scientific & Medical—(Part 18).  
 ITFS: Instructional Television Fixed Service—(Part 74).  
 LTTS: Local Television Transmission Service—(Part 101, Subpart J).  
 MAS: Multipoint Address System—(Part 101).  
 MDS: Multipoint Distribution Service—(Part 21).  
 OFS: Private Operational Fixed Point-to-Point Microwave Service—(Part 101, Subparts C & H).  
 PCS: Personal Communications Service—(Part 24).  
 SAT: Fixed Satellite Service—(Part 25).

Notes:  
 F—Fixed. M—Mobile. TF—Temporary Fixed.  
 (1)—Applications for frequencies in the 932.5–935/941.5–944 MHz bands may be filed initially during a one-week period to be announced by public notice. After these applications have been processed, the Commission will announce by public notice a filing date for remaining frequencies. From this filing date forward, applications will be processed on a daily first-come, first-served basis.

**§ 101.103 Frequency coordination procedures.**  
 (a) Assignment of frequencies will be made only in such a manner as to facilitate the rendition of communication service on an interference-free basis in each service

area. Unless otherwise indicated, each frequency available for use by stations in these services will be assigned exclusively to a single applicant in any service area. All applicants for, and licensees of, stations in these services must cooperate in the selection and use

of the frequencies assigned in order to minimize interference and thereby obtain the most effective use of the authorized facilities. In the event harmful interference occurs or appears likely to occur between two or more radio systems and such interference

cannot be resolved between the licensees thereof, the Commission may specify a time sharing arrangement for the stations involved or may, after notice and opportunity for hearing, require the licensees to make such changes in operating techniques or equipment as it may deem necessary to avoid such interference.

(b) The provisions of this section do not apply to operations in the band 31.0 to 31.3 GHz. Operations in this band are unprotected and subject to harmful interference from other licensed operations in this band.

(c) Frequency diversity transmission will not be authorized in these services in the absence of a factual showing that the required communications cannot practically be achieved by other means. Where frequency diversity is deemed to be justified on a protection channel basis, it will be limited to one protection channel for the bands 3,700–4,200, 5925–6425, and 6525–6875 MHz, and a ratio of one protection channel for three working channels for the bands 10,550–10,680 and 10,700–11,700 MHz. In the bands 3,700–4,200, 5,925–6,425, and 6525–6875 MHz, no frequency diversity protection channel will be authorized unless there is a minimum of three working channels, except that where a substantial showing is made that a total of three working channels will be required within three years, a protection channel may be authorized simultaneously with the first working channel. A protection channel authorized under such exception will be subject to termination if applications for the third working channel are not filed within three years of the grant date of the applications for the first working channel. Where equipment employing digital modulation techniques with cross-polarized operation on the same frequency is used, the protection channel authorized under the above conditions may be considered to consist of both polarizations of the protection frequency where such is shown to be necessary.

(d) Frequency coordination. For each frequency authorized under this part, the following frequency usage coordination procedures will apply:

(1) General requirements. Proposed frequency usage must be prior coordinated with existing licensees, permittees and applicants in the area, and other applicants with previously filed applications, whose facilities could affect or be affected by the new proposal in terms of frequency interference on active channels, applied-for channels, or channels coordinated for future growth. Coordination must be completed prior to filing an application for regular

authorization, or an amendment to a pending application, or any major modification to a license. In coordinating frequency usage with stations in the fixed satellite service, applicants must also comply with the requirements of § 101.21(f). In engineering a system or modification thereto, the applicant must, by appropriate studies and analyses, select sites, transmitters, antennas and frequencies that will avoid interference in excess of permissible levels to other users. All applicants and licensees must cooperate fully and make reasonable efforts to resolve technical problems and conflicts that may inhibit the most effective and efficient use of the radio spectrum; however, the party being coordinated with is not obligated to suggest changes or re-engineer a proposal in cases involving conflicts. Applicants should make every reasonable effort to avoid blocking the growth of systems as prior coordinated. The applicant must identify in the application all entities with which the technical proposal was coordinated. In the event that technical problems are not resolved, an explanation must be submitted with the application. Where technical problems are resolved by an agreement or operating arrangement between the parties that would require special procedures be taken to reduce the likelihood of interference in excess of permissible levels (such as the use of artificial site shielding) or would result in a reduction of quality or capacity of either system, the details thereof may be contained in the application.

(2) Coordination procedure guidelines are as follows:

(i) Coordination involves two separate elements: notification and response. Both or either may be oral or in written form. To be acceptable for filing, all applications and major technical amendments must certify that coordination, including response, has been completed. The names of the licensees, permittees and applicants with coordinated proposals, applicants, permittees, and licensees with which coordination was accomplished must be specified. If such notice and/or response is oral, the party providing such notice or response must supply written documentation of the communication upon request;

(ii) Notification must include relevant technical details of the proposal. At minimum, this should include, as applicable, the following:

Applicant's name and address.  
Transmitting station name.  
Transmitting station coordinates.  
Frequencies and polarizations to be added, changed or deleted.

Transmitting equipment type, its stability, actual output power, emission designator, and type of modulation (loading).

Transmitting antenna type(s), model, gain and, if required, a radiation pattern provided or certified by the manufacturer.  
Transmitting antenna center line height(s) above ground level and ground elevation above mean sea level.

Receiving station name.

Receiving station coordinates.

Receiving antenna type(s), model, gain, and, if required, a radiation pattern provided or certified by the manufacturer.

Receiving antenna center line height(s) above ground level and ground elevation above mean sea level.

Path azimuth and distance.

Estimated transmitter transmission line loss expressed in dB.

Estimated receiver transmission line loss expressed in dB.

Note: The position location of antenna sites shall be determined to an accuracy of no less than  $\pm 1$  second in the horizontal dimensions (latitude and longitude) and  $\pm 1$  meter in the vertical dimension (ground elevation) with respect to the National Spatial Reference System.

(iii) For transmitters employing digital modulation techniques, the notification should clearly identify the type of modulation. Upon request, additional details of the operating characteristics of the equipment must also be furnished;

(iv) Response to notification should be made as quickly as possible, even if no technical problems are anticipated. Any response to notification indicating potential interference must specify the technical details and must be provided to the applicant, in writing, within the 30-day notification period. Every reasonable effort should be made by all applicants, permittees and licensees to eliminate all problems and conflicts. If no response to notification is received within 30 days, the applicant will be deemed to have made reasonable efforts to coordinate and may file its application without a response;

(v) The 30-day notification period is calculated from the date of receipt by the applicant, permittee, or licensee being notified. If notification is by mail, this date may be ascertained by:

(A) The return receipt on certified mail;

(B) The enclosure of a card to be dated and returned by the recipient; or

(C) A conservative estimate of the time required for the mail to reach its destination. In the last case, the estimated date when the 30-day period would expire should be stated in the notification.

(vi) An expedited prior coordination period (less than 30 days) may be requested when deemed necessary by a notifying party. The coordination notice should be identified as "expedited" and

the requested response date should be clearly indicated. However, circumstances preventing a timely response from the receiving party should be accommodated accordingly. It is the responsibility of the notifying party to receive written concurrence (or verbal, with written to follow) from affected parties or their coordination representatives.

(vii) All technical problems that come to light during coordination must be resolved unless a statement is included with the application to the effect that the applicant is unable or unwilling to resolve the conflict and briefly the reason therefor;

(viii) Where a number of technical changes become necessary for a system during the course of coordination, an attempt should be made to minimize the number of separate notifications for these changes. Where the changes are incorporated into a completely revised notice, the items that were changed from the previous notice should be identified. When changes are not numerous or complex, the party receiving the changed notification should make an effort to respond in less than 30 days. When the notifying party believes a shorter response time is reasonable and appropriate, it may be helpful for that party to so indicate in the notice and perhaps suggest a response date;

(ix) If, after coordination is successfully completed, it is determined that a subsequent change could have no impact on some parties receiving the original notification, these parties must be notified of the change and of the coordinator's opinion that no response is required;

(x) Applicants, permittees and licensees should supply to all other applicants, permittees and licensees within their areas of operations, the name, address and telephone number of their coordination representatives. Upon request from coordinating applicants, permittees and licensees, data and information concerning existing or proposed facilities and future growth plans in the area of interest should be furnished unless such request is unreasonable or would impose a significant burden in compilation;

(xi) Parties should keep other parties with whom they are coordinating advised of changes in plans for facilities previously coordinated. If applications have not been filed 6 months after coordination was initiated, parties may assume that such frequency use is no longer desired unless a second notification has been received within 10 days of the end of the 6 month period. Renewal notifications are to be sent to

all originally notified parties, even if coordination has not been successfully completed with those parties; and

(xii) Any frequency reserved by a licensee for future use in the bands subject to this part must be released for use by another licensee, permittee or applicant upon a showing by the latter that it requires an additional frequency and cannot coordinate one that is not reserved for future use.

(e) Where frequency conflicts arise between co-pending applications in the Private Operational Fixed Point-to-Point Microwave, Common Carrier Fixed Point-to-Point Microwave and Local Television Transmission Services, it is the obligation of the later filing applicant to amend his application to remove the conflict, unless it can make a showing that the conflict cannot be reasonably eliminated. Where a frequency conflict is not resolved and no showing is submitted as to why the conflict cannot be resolved, the Commission may grant the first filed application and dismiss the later filed application(s) after giving the later filing applicant(s) 30 days to respond to the proposed action.

(f) When the proposed facilities are to be operated in the band 12,500–12,700 MHz, applications must also follow the procedures in § 101.21 and the technical standards and requirements of part 25 of this chapter as regards licensees in the Communication-Satellite Service.

#### **§ 101.105 Interference protection criteria.**

(a) The interference protection criteria for fixed stations subject to this part are as follows:

(1) To long-haul analog systems, employing frequency modulated radio and frequency division multiplexing to provide multiple voice channels, the allowable interference level per exposure:

(i) Due to co-channel sideband-to-sideband interference must not exceed 5 pwpO (Picowatts of absolute noise power psophometrically weighted (pwpO), appearing in an equivalent voice band channel of 300–3400 Hz); or

(ii) Due to co-channel carrier-beat interference must not exceed 50 pwpO.

(2) To short-haul analog systems employing frequency modulated radio and frequency division multiplexing to provide multiple voice channels, the allowable interference level per exposure:

(i) Due to co-channel sideband-to-sideband interference must not exceed 25 pwpO except in the 952–960 MHz band interference into single link fixed relay and control stations must not exceed 250 pwpO per exposure; or

(ii) Due to co-channel carrier-beat interference must not exceed 50 pwpO except in the 952–960 MHz band interference into single link fixed relay and control stations must not exceed 1000 pwpO per exposure.

(3) FM–TV. In analog systems employing frequency modulated radio that is modulated by a standard, television (visual) signal, the allowable interference level per exposure may not exceed the levels which would apply to long-haul or short-haul FM–FDM systems, as outlined in paragraphs (b) (1) and (2) of this section, having a 600–1200 voice channel capacity.

(b) In addition to the requirements of paragraph (a) of this section the adjacent channel interference protection criteria to be afforded, regardless of system length, or type of modulation, multiplexing, or frequency band, must be such that the interfering signal does not produce more than 1.0 dB degradation of the practical threshold of the protected receiver. The “practical threshold” of the protected receiver can be based upon the definition in TSB 10, referenced in paragraph (c) of this section, or upon alternative generally acceptable good engineering standards.

(c) Applying the Criteria.

(1) Guidelines for applying the interference protection criteria for fixed stations subject to this part are specified in the Telecommunications Industry Association's Telecommunications Systems Bulletin TSB 10, “Interference Criteria for Microwave Systems” (TSB 10). Other procedures that follow generally acceptable good engineering practices are also acceptable to the Commission.

(2) If TSB 10 guidelines cannot be used, the following interference protection criteria may be used by calculating the ratio in dB between the desired (carrier signal) and the undesired (interfering) signal (C/I ratio) appearing at the input to the receiver under investigation (victim receiver): Except as provided in § 101.147 where the applicants proposed facilities are of a type not included in paragraphs (a) and (b) of this section or where the development of the carrier-to-interference (C/I) ratio is not covered by generally acceptable procedures, or where the applicant does not wish to develop the carrier-to-interference ratio, the applicant must, in the absence of criteria or a developed C/I ratio, employ the following C/I protection ratios:

(i) *Co-channel interference*: Both sideband and carrier-beat, applicable to all bands; the existing or previously authorized system must be afforded a carrier to interfering signal protection ratio of at least 90 dB except in the 952–

960 MHz band where it must be 75 dB; or

(ii) *Adjacent channel interference:* Applicable to all bands; the existing or previously authorized system must be afforded a carrier to interfering signal protection ratio of at least 56 dB.

(3) Applicants for frequencies listed in § 101.147(b)(1) must make the following showings that protection criteria have been met over the entire service area of existing systems. Such showings may be made by the applicant or may be satisfied by a statement from a frequency coordinator.

(i) For multiple address stations in the 928–929/952–960 MHz bands, a statement that the proposed system complies with the following co-channel separations from all existing stations and pending applications:

- Fixed-to-fixed—145 km;
- Fixed-to-mobile—113 km;
- Mobile-to-mobile 81 km

Note to (3)(i): Multiple address systems employing only remote stations will be treated as mobile for the purposes of determining the appropriate separation. For mobile operation, the mileage is measured from the reference point specified on the license application. For fixed operation on subfrequencies in accordance with § 101.147 the mileage also is measured from the reference point specified on the license application;

(ii) For multiple address stations in the 932–932.5/941–941.5 MHz bands, a statement that the proposed system complies with the following co-channel separation from all existing stations and pending applications:

- Fixed-to-fixed—113 Km

(iii) In cases where the geographic separation standard in paragraphs (c)(3)(i) and (c)(3)(ii) of this section are not followed, an engineering analysis must be submitted to show the coordination of the proposed assignment with existing systems located closer than those standards. The engineering analyses will include:

(A) Specification of the interference criteria and system parameters used in the interference study;

(B) Nominal service areas of each system included in the interference analysis.;

(C) Modified service areas resulting from the proposed system. The propagation models used to establish the service boundary limits must be specified and any special terrain features considered in computing the interference impact should be described; and

(D) A statement that all parties affected have agreed to the engineering analysis and will accept the calculated levels of interference.

(4) Multiple address systems operating on subfrequencies in accordance with § 101.147 that propose to operate master stations at unspecified locations must define the operating area by a radius about a geographical coordinate and describe how interference to co-channel users will be controlled.

(5) Multiple address frequencies in the 956 MHz band may be assigned for use by mobile master stations on a primary basis. Multiple address frequencies in the 952 MHz band may be assigned for use by mobile master stations on a case-by-case basis. Mobile operation in the 952 MHz band will be on a secondary basis to fixed operations.

(6) Each application for new or modified nodal station on channels numbered 4A, 4B, 7, 9, and 19/20 in the 10.6 GHz band and all point-to-multipoint channels in the 18 GHz band must demonstrate that all existing co-channel stations are at least 56 kilometers from the proposed nodal station site. Applicants for these channels must certify that all licensees and applicants for stations on the adjacent channels within 56 kilometers of the proposed nodal station have been notified of the proposed station and do not object. Alternatively, or if one of the affected adjacent channel interests does object, the applicant may show that all affected adjacent channel parties are provided a C/I protection ratio of 0 dB. An applicant proposing to operate at an AAT greater than 91 meters must reduce its EIRP in accordance with the following table; however, in no case may EIRP exceed 70 dBm on the 10.6 GHz channels.

AAT (meters)	EIRP dBm
Above 300 .....	+38
251 to 300 .....	41
201 to 250 .....	43
151 to 200 .....	49
101 to 150 .....	55
100 and below .....	85

(7) Each application for new or modified nodal station on channels numbered 21, 22, 23, and 24 in the 10.6 GHz band must include an analysis of the potential for harmful interference to all other licensed and previously applied for co-channel and adjacent channel station located within 80 kilometers of the location of the proposed station. The criteria contained in § 101.103(d)(2) must be used in this analysis. Applicants must certify that copies of this analysis have been served on all parties which might reasonably be expected to receive interference above the levels set out in § 101.103(d)(2)

within 5 days of the date the subject application is filed with the Commission.

(8) If the potential interference will exceed the prescribed limits, a statement shall be submitted with the application for new or modified stations to the effect that all parties have agreed to accept the higher level of interference.

(d) Effective August 1, 1985, when a fixed station that conforms to the technical standards of this subpart (or, in the case of the 12,200–12,700 MHz band, a direct broadcast satellite station) receives or will receive interference in excess of the levels specified in this section as a result of an existing licensee's use of non-conforming equipment authorized between July 20, 1961 and July 1, 1976, and the interference would not result if the interfering station's equipment complied with the current technical standards, the licensee of the non-conforming station must take whatever steps are necessary to correct the situation up to the point of installing equipment which fully conforms to the technical standards of this subpart. In such cases, if the engineering analysis demonstrates that:

(1) The conforming station would receive interference from a non-conforming station in excess of the levels specified in this section; and

(2) The interference would be eliminated if the non-conforming equipment were replaced with equipment which complies with the standards of this subpart, the licensee (or prospective licensee) of the station which would receive interference must provide written notice of the potential interference to both the non-conforming licensee and the Commission's office in Gettysburg, PA. The non-conforming licensee must make all required equipment changes within 180 days from the date of official Commission notice informing the licensee that it must upgrade its equipment, unless an alternative solution has been agreed to by all parties involved in the interference situation. If a non-conforming licensee fails to make all required changes within the specified period of time, the Commission may require the licensee to suspend operation until the changes are completed.

(e) Interference Dispute Resolution Procedures. Should a licensee licensed under this part receive harmful interference from another licensee licensed under this chapter, the parties involved shall comply with the dispute resolution procedures set forth herein:

(1) The licensee experiencing the harmful interference shall notify the licensee believed to be causing the harmful interference and shall supply information describing its problem and supporting its claim;

(2) Upon receipt of the harmful interference notice, the licensee alleged to be causing the harmful interference

shall respond immediately and make every reasonable effort to identify and resolve the conflict; and  
 (3) Licensees are encouraged to resolve the harmful interference prior to contacting the Commission.

**§ 101.107 Frequency tolerance.**

(a) The carrier frequency of each transmitter authorized in these services

must be maintained within the following percentage of the reference frequency except as otherwise provided in paragraph (b) of this section or in the applicable subpart of this part (unless otherwise specified in the instrument of station authorization the reference frequency will be deemed to be the assigned frequency):

Frequency (MHz)	Frequency Tolerance (percent)		
	All fixed and base stations	Mobile stations over 3 watts	Mobile stations 3 watts or less
928 to 929 <sup>2,5</sup>	0.0005		
932 to 932.5 <sup>2</sup>	0.00015		
932.5 to 935 <sup>2</sup>	0.00025		
941 to 941.5	0.00015		
941.5 to 944	0.00025		
952 to 960 <sup>7</sup>			
944.0 to 1,000	0.0005	0.0005	0.0005
1,850 to 1,990	0.002		
2,110 to 2,200	0.001		
2,200 to 12,200 <sup>1,3</sup>	0.005	0.005	0.005
2,450 to 2,500	0.001		
3,700 to 4,200	0.005		
5,925 to 6,875	0.005		
10,550 to 11,700	0.005		
12,200 to 13,250 <sup>6</sup>	0.005		
12,200 to 17,700	0.03	0.03	0.03
17,700 to 18,820 <sup>4,5</sup>	0.003		
18,820 to 18,920 <sup>4,5</sup>	0.001		
18,920 to 19,700 <sup>4,5</sup>	0.003		
19,700 to 40,000 <sup>6</sup>	0.03	0.03	0.03

<sup>1</sup> Applicable only to common carrier LTTS stations. Beginning Aug. 9, 1975, this tolerance will govern the marketing of LTTS equipment and the issuance of all such authorizations for new radio equipment. Until that date new equipment may be authorized with a frequency tolerance of .03 percent in the frequency range 2,200 to 10,500 MHz and .05 percent in the range 10,500 MHz to 12,200 MHz, and equipment so authorized may continue to be used for its life provided that it does not cause interference to the operation of any other licensee.

<sup>2</sup> Equipment authorized to be operated on frequencies between 890 and 940 MHz as of Oct. 15, 1956, must maintain a frequency tolerance within 0.03 percent subject to the condition that no harmful interference is caused to any other radio station.

<sup>3</sup> See subpart G of this part for the stability requirements for transmitters used in the Digital Electronic Message Service.

<sup>4</sup> Existing type accepted equipment with a frequency tolerance of ±0.03% may be marketed until December 1, 1988. Equipment installed and operated prior to December 1, 1988 may continue to operate after that date with a minimum frequency tolerance of ±0.03%. However, the replacement of equipment requires that the ±0.003% tolerance be met.

<sup>5</sup> For remote stations with 12.5 KHz bandwidth, the tolerance is ±0.00015%.

<sup>6</sup> Applicable to private operational fixed point-to-point microwave only. For exceptions see § 101.147.

<sup>7</sup> For private operational fixed point-to-point microwave systems, with a channel greater than or equal to 50 KHz bandwidth, ±0.0005%; for multiple address master stations, regardless of bandwidth, ±0.00015%; for multiple address remote stations with 12.5 KHz bandwidths, ±0.00015%; for multiple address remote stations with channels greater than 12.5 KHz bandwidth, ±0.0005%.

(b) Heterodyne microwave radio systems may be authorized at a somewhat less restrictive frequency tolerance (up to .01 percent) to compensate for frequency shift caused by numerous repeaters between base band signal insertion. Where such relaxation is sought, applicant must provide all calculations and indicate the desired tolerance over each path. In such instances the radio transmitters and receivers used must individually be capable of complying with the tolerance specified in paragraph (a) of this section. Heterodyne operation is restricted to channel bandwidth of 10 MHz or greater.

(c) As an additional requirement in any band where the Commission makes

assignments according to a specified channel plan, provisions must be made to prevent the emission included within the occupied bandwidth from radiating outside the assigned channel at a level greater than that specified in § 101.111.

**§ 101.109 Bandwidth.**

(a) Each authorization issued pursuant to these rules will show, as the emission designator, a symbol representing the class of emission which must be prefixed by a number specifying the necessary bandwidth. This figure does not necessarily indicate the bandwidth actually occupied by the emission at any instant. In those cases where part 2 of this chapter does not provide a formula for the computation

of the necessary bandwidth, the occupied bandwidth may be used in the emission designator.

(b) Stations in this service will be authorized any type of emission, method of modulation, and transmission characteristic, consistent with efficient use of the spectrum and good engineering practice, except that Type B, damped-wave emission will not be authorized.

(c) The maximum bandwidth which will be authorized per frequency assigned is set out in the table that follows. Regardless of the maximum authorized bandwidth specified for each frequency band, the Commission reserves the right to issue a license for less than the maximum bandwidth if it

appears that a lesser bandwidth would be sufficient to support an applicant's intended communications.

Frequency band (MHz)	Maximum authorized bandwidth
928 to 929 .....	25 KHz <sup>1 6</sup>
932 to 932.5, 941 to 941.5.	12.5 KHz <sup>1</sup>
932.5 to 935, 941.5 to 944.	200 KHz <sup>1</sup>
952 to 960 .....	200 KHz <sup>1 5</sup>
1,850 to 1,990 .....	10 MHz <sup>1</sup>
2,110 to 2,130 .....	3.5 MHz
2,130 to 2,150 .....	800 or 1600 KHz <sup>1</sup>
2,150 to 2,160 .....	10 MHz
2,160 to 2,180 .....	3.5 MHz
2,180 to 2,200 .....	800 or 1600 KHz <sup>1</sup>
2,450 to 2,483.5 .....	625 KHz <sup>2</sup>
2,483.5 to 2,500 .....	800 KHz
3,700 to 4,200 .....	20 MHz
5,925 to 6,425 .....	30 MHz <sup>1</sup>
6,425 to 6,525 .....	25 MHz
6,525 to 6,875 .....	10 MHz <sup>1</sup>
10,550 to 10,680 .....	5 MHz <sup>1</sup>
10,700 to 11,700 .....	40 MHz <sup>1</sup>
12,200 to 12,700 .....	20 MHz <sup>1</sup>
13,200 to 13,250 .....	25 MHz
17,700 to 18,140 .....	220 MHz <sup>1</sup>
18,140 to 18,142 .....	2 MHz
18,142 to 18,580 .....	6 MHz
18,580 to 18,820 .....	20 MHz <sup>1</sup>
18,820 to 18,920 .....	10 MHz
18,920 to 19,160 .....	20 MHz <sup>1</sup>
19,160 to 19,260 .....	10 MHz
19,260 to 19,700 .....	220 MHz <sup>1</sup>
21,200 to 23,600 .....	100 MHz <sup>4</sup>
27,500 to 29,500 .....	220 MHz
31,000 to 31,300 .....	25 or 50 MHz
38,600 to 40,000 .....	50 MHz Bands above 40,000 <sup>3</sup>

<sup>1</sup> The maximum bandwidth that will be authorized for each particular frequency in this band is detailed in the appropriate frequency table in § 101.147.

<sup>2</sup> 1250 KHz, 1875 KHz, or 2500 KHz on a case-by-case basis.

<sup>3</sup> To be specified in authorization.

<sup>4</sup> For exceptions, see § 101.147(t).

<sup>5</sup> A 12.5 KHz bandwidth applies only to frequencies listed in § 101.147(b)(1).

<sup>6</sup> For frequencies listed in § 101.147(b)(1), consideration will be given on a case-by-case basis to authorizing bandwidths up to 50 KHz.

**§ 101.111 Emission limitations.**

(a) The mean power of emissions must be attenuated below the mean output power of the transmitter in accordance with the following schedule:

(1) When using transmissions other than those employing digital modulation techniques:

(i) On any frequency removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: At least 25 decibels;

(ii) On any frequency removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: At least 35 decibels;

(iii) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least  $43+10 \log_{10}$  (mean output power in watts) decibels, or 80 decibels, whichever is the lesser attenuation.

(2) When using transmissions employing digital modulation techniques (see § 101.141(b)) in situations not covered in this section:

(i) For operating frequencies below 15 GHz, in any 4 KHz band, the center frequency of which is removed from the assigned frequency by more than 50 percent up to and including 250 percent of the authorized bandwidth: As specified by the following equation but in no event less than 50 decibels:

$$A=35+0.8(P-50)+10 \log_{10} B.$$

(Attenuation greater than 80 decibels is not required.)

where:

A=Attenuation (in decibels) below the mean output power level.

P=Percent removed from the carrier frequency.

B=Authorized bandwidth in MHz.

(ii) For operating frequencies above 15 GHz, in any 1 MHz band, the center frequency of which is removed from the assigned frequency by more than 50 percent up to and including 250 percent of the authorized bandwidth: As specified by the following equation but in no event less than 11 decibels:

$$A=11+0.4(P-50)+10 \log_{10} B.$$

(Attenuation greater than 56 decibels is not required.)

(iii) In any 4 KHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least  $43+10 \log_{10}$  (mean output power in watts) decibels, or 80 decibels, whichever is the lesser attenuation.

(3) For Digital Termination System channels used in the Digital Electronic Message Service (DEMS) operating in the 10,550–10,680 MHz band:

(i) In any 4 KHz band, the center frequency of which is removed from the edge of the DEMS channel by up to and including 1.125 times the DEMS subchannel bandwidth: As specified by the following equation may in no event be less than  $50+10 \log_{10} N$  decibels:

$$A=50+0.0333 (F-0.5B)+10 \log_{10} N$$

decibels

Where:  
A=Attenuation (in decibels) below means output power level contained within the DEMS channel for a given polarization.

B=Bandwidth of DEMS channel (in KHz).

F=Absolute value of the difference between the center frequency of the

4 KHz band measured and the center frequency of the DEMS channel (in KHz).

N=Number of active subchannels of the given polarization within the DEMS channel.

(ii) In any 4 KHz band within the authorized DEMS band the center frequency of which is removed from the center frequency of the DEMS channel by more than the sum of 50% of the DEMS channel bandwidth plus 1.125 times the subchannel bandwidth: As specified by the following equation but in no event less than 80 decibels:

$$A=80+10 \log_{10} N \text{ decibels}$$

(iii) In any 4 KHz band the center frequency of which is outside the authorized DEMS band: At least  $43+10 \log_{10}$  (mean output power in watts) decibels.

(4) For Digital Termination System channels used in the Digital Electronic Message Service (DEMS) operating in the 17,700–19,700 MHz band:

(i) In any 4 KHz band, the center frequency of which is removed from the frequency of the center of the DEMS channel by more than 50 percent of the DEMS channel bandwidth up to and including 50 percent plus 500 KHz: As specified by the following equation but in no event be less than  $50+10 \log_{10} N$  decibels:

$$A=50+0.06 (F-0.5B)+10 \log_{10} N \text{ decibels}$$

Where:

A=Attenuation (in decibels) below means output power level contained within the DEMS channel for a given polarization.

B=Bandwidth of DEMS channel (in KHz).

F=Absolute value of the difference between the center frequency of the 4 KHz band measured and the center frequency of the DEMS channel (in KHz).

N=Number of active subchannels of the given polarization within the DEMS channel.

(ii) In any 4 KHz band within the authorized DEMS band, the center frequency of which is removed from the center frequency of the DEMS channel by more than the sum of 50 percent of the channel bandwidth plus 500 KHz: As specified by the following equation but in no event less than 80 decibels:

$$A=80+10 \log_{10} N \text{ decibels}$$

(iii) In any 4 KHz band the center frequency of which is outside the authorized Digital Message Service band: At least  $43+10 \log_{10}$  (mean output power in watts) decibels.

(5) When using transmissions employing digital modulation techniques on the 900 MHz multiple address frequencies with a 12.5 KHz

bandwidth, the power of any emission must be attenuated below the unmodulated carrier power of the transmitter (P) in accordance with the following schedule:

(i) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) of more than 2.5 KHz up to and including 6.25 KHz: At least  $53 \log_{10} (fd/2.5)$  decibels;

(ii) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) of more than 6.25 KHz up to and including 9.5 KHz: At least  $103 \log_{10} (fd/3.9)$  decibels;

(iii) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) of more than 9.5 KHz up to and including 15 KHz: At least  $157 \log_{10} (fd/5.3)$  decibels; and

(iv) On any frequency removed from the center of the authorized bandwidth by a displacement frequency greater than 15 KHz: At least 50 plus  $10 \log_{10}(P)$  or 70 decibels, whichever is the lesser attenuation.

(6) When using transmissions employing digital modulation techniques on the 900 MHz multiple address frequencies with a bandwidth greater than 12.5 KHz, the power of any emission must be attenuated below the unmodulated carrier power of the transmitter (P) in accordance with the following schedule:

(i) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) of more than 5 KHz up to and including 10 KHz: At least  $83 \log_{10} (fd/5)$  decibels;

(ii) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) of more than 10 KHz up to and including 250 percent of the authorized bandwidth: At least  $116 \log_{10} (fd/6.1)$  decibels or 50 plus  $10 \log_{10} (P)$  or 70 decibels, whichever is the lesser attenuation; and

(iii) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 plus  $10 \log_{10}$  (output power in watts) decibels or 80 decibels, whichever is the lesser attenuation.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in paragraph (a) of this section.

(c) The emission of an unmodulated carrier is prohibited except for test purposes as required for proper station and system maintenance.

**§ 101.113 Transmitter power limitations.**

(a) On any authorized frequency, the average power delivered to an antenna in this service must be the minimum amount of power necessary to carry out the communications desired.

Application of this principle includes, but is not to be limited to, requiring a licensee who replaces one or more of its antennas with larger antennas to reduce its antenna input power by an amount appropriate to compensate for the increased primary lobe gain of the replacement antenna(s). In no event shall the average equivalent isotropically radiated power (EIRP), as referenced to an isotropic radiator, exceed the values specified below. In cases of harmful interference, the Commission may, after notice and opportunity for hearing, order a change in the effective radiated power of this station. Further, the output power of a transmitter on any authorized frequency in this service may not exceed the following:

Frequency Band (MHz)	Maximum allowable EIRP <sup>1 2</sup>	
	Fixed (dBW)	Mobile (dBW)
928.0 to 929.0 .....	+17	.....
932.0 to 932.5 .....	+17	.....
932.5 to 935.0 .....	+40	.....
941.0 to 941.5 .....	+30	.....
941.5 to 944.0 .....	+40	.....
952.0 to 960.0 <sup>2</sup> .....	+40	.....
1,850 to 1,990 .....	+45	.....
2,110 to 2,130 .....	+45	.....
2,130 to 2,150 .....	+45	.....
2,150 to 2,160 <sup>3</sup> .....	+45	.....
2,160 to 2,180 <sup>3</sup> .....	+45	.....
2,180 to 2,200 .....	+45	.....
2,450 to 2,500 .....	+45	.....
2,500 to 2,686 <sup>4</sup> .....	.....	.....
2,686 to 2,690 <sup>4</sup> .....	+45	.....
3,700 to 4,200 .....	+55	.....
5,925 to 6,425 <sup>4</sup> .....	+55	.....
6,425 to 6,525 <sup>4</sup> .....	.....	+35
6,525 to 6,875 <sup>4</sup> .....	+55	.....
10,550 to 10,680 <sup>5</sup> .....	+55	.....
10,700 to 11,700 .....	+55	.....
12,200 to 12,700 .....	+50	.....
12,700 to 13,250 <sup>4</sup> .....	+50	.....
17,700 to 18,600 .....	+55	.....
18,600 to 18,800 <sup>6</sup> .....	+35	.....
18,800 to 19,700 .....	+55	.....
21,200 to 23,600 <sup>7</sup> .....	<sup>5</sup> +55	.....
27,500 to 29,500 .....	+55	.....
31,000 to 31,300 .....	( <sup>8</sup> )	( <sup>8</sup> )
38,600 to 40,000 .....	+55	.....

<sup>1</sup> Per polarization.

<sup>2</sup> For multiple address operations, see § 101.147. Remote alarm units that are part of a multiple address central station protection system are authorized a maximum of 2 watts.

<sup>3</sup> When an omnidirectional antenna is authorized in the 2150–2160 MHz band, the maximum power shall be 60 dBm.

<sup>4</sup> Also, see § 101.145.

<sup>5</sup> The output power of a DEMS System nodal transmitter shall not exceed 0.5 watts per 250 KHz. The output power of a DEMS System user transmitter shall not exceed 0.04 watts per 250 KHz. The transmitter power in terms of the watts specified is the peak envelope power of the emission measured at the associated antenna input port. The operating power shall not exceed the authorized power by more than 10 percent of the authorized power in watts at any time.

<sup>6</sup> Maximum power delivered to the antenna shall not exceed -3 dBW.

<sup>7</sup> Also, see § 101.147(t).

<sup>8</sup> The maximum transmit power is 0.05 watts.

(b) The power of transmitters that use Automatic Transmitter Power Control shall not exceed the power input or output specified in the instrument of station authorization. The power of non-ATPC transmitters shall be maintained as near as practicable to the power input or output specified in the instrument of station authorization.

**§ 101.115 Directional antennas.**

(a) Unless otherwise authorized upon specific request by the applicant, each station authorized under the rules of this part must employ a directional antenna adjusted with the center of the major lobe of radiation in the horizontal plane directed toward the receiving station with which it communicates: *provided, however*, where a station communicates with more than one point, a multi- or omni-directional antenna may be authorized if necessary. New Periscope antenna systems will not, under ordinary circumstances, be authorized.

(b) Stations operating below 932.5 MHz that are required to use directional antennas must employ antennas meeting the standards indicated below. (Maximum beamwidth is for the major lobe of radiation at the half power points. Suppression is the minimum attenuation required for any secondary lobe signal and is referenced to the maximum signal in the main lobe.)

Frequency range	Maximum beamwidth (degrees)	Suppression (dB)
512 to 932.5 MHz .....	20	13

(c) Fixed stations (other than temporary fixed stations and DEMS nodal stations) operating at 932.5 MHz or higher must employ transmitting and receiving antennas (excluding second receiving antennas for operations such as space diversity) meeting the appropriate performance Standard A indicated below, except that in areas not subjected to frequency congestion antennas meeting performance Standard B may be used subject to the

requirements set forth in paragraph (d) of this section.

ANTENNA STANDARDS

Frequency (MHz)	Category	Maximum beam width to 3 dB points (included angles in degrees)	Minimum antenna gain (dbi)	Minimum radiation suppression to angle in degrees from centerline of main beam in decibels						
				5° to 10°*	10° to 15°*	15° to 20°*	20° to 30°*	30° to 100°*	100° to 140°*	140° to 180°*
932.5 to 935	A	14.0	N/A		6	11	14	17	20	24
	B	20.0	N/A			6	10	13	15	20
941.5 to 944	A	14.0	N/A		6	11	14	17	20	24
	B	20.0	N/A			6	10	13	15	20
952 to 960 <sup>8,9</sup>	A	14.0	N/A		6	11	14	17	20	24
	B	20.0	N/A			6	10	13	15	20
1,850 to 2,500 <sup>11</sup>	A	5.0	N/A	12	18	22	25	29	33	39
	B	8.0	N/A	5	18	20	20	25	28	36
3,700 to 4,200	A	N/A	36	23	29	33	36	42	55	55
	B	N/A	36	20	24	28	32	32	32	32
5,925 to 6,425 <sup>5</sup>	A	N/A	38	25	29	33	36	42	55	55
	B	N/A	38	21	25	29	32	35	39	45
5,925 to 6,425 <sup>6</sup>	A	N/A	38	25	29	33	36	42	55	55
	B	N/A	38	20	24	28	32	35	36	36
6,525 to 6,875 <sup>5</sup>	A	N/A	38	25	29	33	36	42	55	55
	B	N/A	38	21	25	29	32	35	39	45
6,525 to 6,875 <sup>6</sup>	A	1.5	N/A	26	29	32	34	38	41	49
	B	2.0	N/A	21	25	29	32	35	39	45
10,550 to 10,680 <sup>4,5</sup>	A	N/A	38	25	29	33	36	42	55	55
	B	N/A	38	20	24	28	32	35	35	39
10,550 to 10,680 <sup>6</sup>	A	3.4	34	20	24	28	32	35	55	55
	B	3.4	34	20	24	28	32	35	35	39
10,565 to 10,615 <sup>7</sup>	N/A	360	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10,630 to 10,680 <sup>7</sup>	N/A	N/A	34	20	24	28	32	35	36	36
10,700 to 11,700 <sup>5</sup>	A	N/A	38	25	29	33	36	42	55	55
	B	N/A	38	20	24	28	32	35	36	36
12,200 to 13,250 <sup>12</sup>	A	1.0	N/A	23	28	35	39	41	42	50
	B	2.0	N/A	20	25	28	30	32	37	47
17,700 to 18,820	A	N/A	38	25	29	33	36	42	55	55
	B	N/A	38	20	24	28	32	35	36	36
18,920 to 19,700 <sup>1</sup>	A	N/A	38	25	29	33	36	42	55	55
	B	N/A	38	20	24	28	32	35	36	36
21,200 to 23,600 <sup>10</sup>	A	N/A	38	25	29	33	36	42	55	55
	B	N/A	38	20	24	28	32	35	36	36
31,000 to 31,300 <sup>2,3</sup>	N/A	4.0	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Above 31,300	A	N/A	38	25	29	33	36	42	55	55
	B	N/A	38	20	24	28	32	35	36	36

\*1 DEMS User Station antennas in this band must meet performance Standard B and have a minimum antenna gain of 34 dBi. The maximum beamwidth requirement does not apply to DEMS User Stations. DEMS Nodal Stations need not comply with these standards.

<sup>2</sup> The minimum front-to-back ratio must be 38 dBi.

<sup>3</sup> Mobile, except aeronautical mobile, stations need not comply with these standards.

<sup>4</sup> Except for antennas between 140° and 180° authorized or pending on January 1, 1989, in the band 10,550 to 10,565 MHz for which minimum radiation to suppression to angle (in degrees) from centerline of main beam is 36 decibels.

<sup>5</sup> These antenna standards apply to all point-to-point stations authorized after June 1, 1997. Existing licensees and pending applicants on that date are grandfathered and need not comply with these standards.

<sup>6</sup> These antenna standards apply to all point-to-point stations authorized on or before June 1, 1997.

<sup>7</sup> These antenna standards apply only to DEMS User Stations licensed, in operation, or applied for prior to July 15, 1993.

<sup>8</sup> Except for Multiple Address System frequencies listed in where omnidirectional antennas may be used.

<sup>9</sup> Antennas used at outlying stations as part of a central protection alarm system need conform to only the following 2 standards: (i) The minimum on-beam forward gain must be at least 10 dBi; and (ii) the minimum front-to-back ratio must be at least 20 dB.

<sup>10</sup> Except as provided in §101.147(t). **Note to paragraph (10):** Stations must employ an antenna that meets the performance standards for Category A, except that in areas not subject to frequency congestion, antennas meeting standards for Category B may be employed. Note, however, that the Commission may require the use of high performance antennas where interference problems can be resolved by the use of such antennas.

<sup>11</sup> Omnidirectional antennas may be authorized in the band 2150–2160 MHz.

<sup>12</sup> Except for temporary-fixed operations in the band 13200–13250 MHz with output powers less than 250 mW and as provided in §101.147(q).

(d) The Commission shall require the replacement of any antenna or periscope antenna system of a permanent fixed station operating at 932.5 MHz or higher that does not meet performance Standard A specified in paragraph (c) of

this section, at the expense of the licensee operating such antenna, upon a showing that said antenna causes or is likely to cause interference to (or receive interference from) any other authorized or applied for station whereas a higher

performance antenna is not likely to involve such interference. Antenna performance is expected to meet the standards of paragraph (c) of this section for parallel polarization. For cases of potential interference, an antenna will

not be considered to meet Standard A unless the parallel polarization performance for the discrimination angle involved meets the requirements, even if the cross-polarization performance controls the interference.

(e) In cases where passive reflectors are employed in conjunction with transmitting antenna systems, the foregoing paragraphs of this section also will be applicable. However, in such instances, the center of the major lobe of radiation from the antenna normally must be directed at the passive reflector, and the center of the major lobe of radiation from the passive reflector directed toward the receiving station with which it communicates.

(f) Periscope antennas used at an electric power facility plant area will be excluded from the requirements of paragraph (c) of this section on a case-by-case basis where technical considerations or safety preclude the use of other types of antenna systems.

(g) In the event harmful interference is caused to the operation of other stations, the Commission may, after notice and opportunity for hearing, order changes to be made in the height, orientation, gain and radiation pattern of the antenna system.

#### **§ 101.117 Antenna polarization.**

Except as set forth herein, stations operating in the radio services included in this part are not limited as to the type of polarization of the radiated signal, provided, however, that in the event interference in excess of permissible levels is caused to the operation of other stations the Commission may, after notice and opportunity for hearing, order the licensee to change the polarization of the radiated signal. No change in polarization may be made without prior authorization from the Commission. Unless otherwise allowed, only linear polarization (horizontal or vertical) shall be used.

#### **§ 101.119 Simultaneous use of common antenna structures.**

The simultaneous use of common antenna structures by more than one radio station, or by one of more domestic public radio stations and one or more stations of any other class or service, may be authorized: provided, however, that each licensee or user of any such structure is responsible for maintaining the structure, and for painting and illuminating the structure when obstruction marking is required by the Commission. (See § 101.21(a).)

#### **§ 101.121 Marking of antenna structures.**

The owner of each antenna structure required to be painted and/or

illuminated under the provision of section 303(q) of the Communications Act of 1934, as amended, shall operate and maintain the antenna structure painting and lighting in accordance with part 17 of this chapter. In the event of default by the owner, each licensee or permittee shall be individually responsible for conforming to the requirements pertaining to antenna structure painting and lighting. For complete regulations relative to antenna marking requirements, see part 17 of this chapter.

#### **§ 101.123 Quiet zones.**

Quiet zones are those areas where it is necessary to restrict radiation so as to minimize possible impact on the operations of radio astronomy or other facilities that are highly sensitive to radio frequency interference.

(a) In order to minimize possible harmful interference at the National Radio Astronomy Observatory site located at Green Bank, Pocohontas County, W. Va., and at the Naval Radio Research Observatory site at Sugar Grove, Pendleton County, W. Va., any applicant for a station authorization other than temporary-fixed seeking a station license for a new station or to modify an existing station in a manner which would change either the frequency, power, antenna height or directivity, or location of such a station within the area boarded by 39°15' N. on the north, 78°30' W. on the east, 37°30' N. on the south, and 80°30' W. on the west must at the time of filing such application with the Commission, simultaneously notify the Director, National Radio Astronomy Observatory, Post Office Box No. 2, Green Bank, W. Va. 24944, in writing, of the technical particulars of the proposed station. Such notification must include the geographical coordinates of the antenna, antenna height, antenna directivity if any, proposed frequency, type of emission and power. In addition, the applicant must indicate in his application to the Commission the date notification was made to the Observatory. After receipt of such applications, the Commission will allow a period of twenty (20) days for comments or objections in response to the notifications indicated. If an objection to the proposed operation is received during the 20-day period from the National Radio Astronomy Observatory for itself or on behalf of the Naval Radio Research Observatory, the Commission will consider all aspects of the problem and take whatever action is deemed appropriate.

(b) Protection for Table Mountain Radio Receiving Zone, Boulder County,

Colorado. Applicants for a station authorization to operate in the vicinity of Boulder County, Colorado under this part are advised to give due consideration, prior to filing applications, to the need to protect the Table Mountain Radio Receiving Zone from harmful interference. These are the research laboratories of the Department of Commerce, Boulder County, Colorado. To prevent degradation of the present ambient radio signal level at the site, the Department of Commerce seeks to ensure that the field strengths of any radiated signals (excluding reflected signals) received on this 1800 acre site (in the vicinity of coordinates 40°07'50" N. Latitude, 105°14'40" W. Longitude), resulting from new assignments or from the modification or relocation of existing facilities do not exceed 1 mV/m in the authorized bandwidth of service. (A field strength of 1 mV/m is equivalent to a power flux density of 85.8 dBW/M<sup>2</sup> assuming a free-space characteristic impedance of 376.7 ohms.)

(1) Advance consultation is recommended particularly for those applicants who have no reliable data which indicates whether the field strength or power flux density figures would be exceeded by their proposed radio facilities. In such instances, the following is a suggested guide for determining whether coordination is recommended:

- (i) All stations within 2.4 km;
- (ii) Stations within 4.8 km with 50 watts or more effective radiated power (ERP) in the primary plane of polarization in the azimuthal direction of the Table Mountain Receiving Zone;
- (iii) Stations within 16 km with 1 kW or more ERP in the primary plane of polarization in the azimuthal direction of the Table Mountain Receiving Zone; or
- (iv) Stations within 80 km with 25 kW or more ERP in the primary plane of polarization in the azimuthal direction of the Table Mountain Receiving Zone.

(2) Applicants concerned are urged to communicate with the Radio Frequency Management Coordinator, Department of Commerce, Research Support Services, NOAA/R/E5X2, Boulder Laboratories, Boulder CO 80303; telephone (303) 497-6548, in advance of filing their applications with the Commission.

(3) The Commission will not screen applications to determine whether advance consultation has taken place. However, applicants are advised that such consultation can avoid objections from the Department of Commerce or proceedings to modify any authorization which may be granted which, in fact,

delivers a signal at the site in excess of the field strength specified herein.

(c) Protection for Federal Communications Commission monitoring stations:

(1) Applicants in the vicinity of an FCC monitoring station for a radio station authorization to operate new transmitting facilities or changed transmitting facilities which would increase the field strength produced over the monitoring station over that previously authorized are advised to give consideration, prior to filing applications, to the possible need to protect the FCC stations from harmful interference. Geographical coordinates of the facilities which require protection are listed in § 0.121(c) of this chapter. Applications for stations (except mobile stations) which will produce on any frequency a direct wave fundamental field strength of greater than 10 mV/m in the authorized bandwidth of service ( $-65.8$  dBW/m<sup>2</sup> power flux density assuming a free space characteristic impedance of 120 ohms) at the referenced coordinates, may be examined to determine extent of possible interference. Depending on the theoretical field strength value and existing root-sum-square or other ambient radio field signal levels at the indicated coordinates, a clause protecting the monitoring station may be added to the station authorization.

(2) In the event that calculated value of expected field exceeds 10 mV/m ( $-65.8$  dBW/m<sup>2</sup>) at the reference coordinates, or if there is any question whether field strength levels might exceed the threshold value, advance consultation with the FCC to discuss any protection necessary should be considered. Prospective applicants may communicate with: Chief, Compliance and Information Bureau, Federal Communications Commission, Washington, DC 20554, Telephone (202) 418-1100.

(3) Advance consultation is suggested particularly for those applicants who have no reliable data which indicates whether the field strength or power flux density figure indicated would be exceeded by their proposed radio facilities (except mobile stations). In such instances, the following is a suggested guide for determining whether an applicant should coordinate:

- (i) All stations within 2.4 kilometers;
- (ii) Stations within 4.8 kilometers with 50 watts or more average effective radiated power (ERP) in the primary plane of polarization in the azimuthal direction of the Monitoring Stations;
- (iii) Stations within 16 kilometers with 1 kW or more average ERP in the primary plane of polarization in the

azimuthal direction of the Monitoring Station; or

(iv) Stations within 80 kilometers with 25 kW or more average ERP in the primary plane of polarization in the azimuthal direction of the Monitoring Station.

(4) Advance coordination for stations operating above 1000 MHz is recommended only where the proposed station is in the vicinity of a monitoring station designated as a satellite monitoring facility in § 0.121(c) of this chapter and also meets the criteria outlined in paragraphs (c)(2) and (c)(3) of this section.

(5) The Commission will not screen applications to determine whether advance consultation has taken place. However, applicants are advised that such consultation can avoid objections from the Federal Communications Commission or modification of any authorization which will cause harmful interference.

#### **§ 101.125 Temporary fixed antenna height restrictions.**

The overall antenna structure heights employed by mobile stations in the Local Television Transmission Service and by stations authorized to operate at temporary fixed locations may not exceed the height criteria set forth in § 17.7 of this chapter, unless in each instance, authorization for use of a specific maximum antenna height (above ground and above mean sea level) for each location has been obtained from the Commission prior to erection of the antenna. Requests for such authorization must show the inclusive dates of the proposed operation. (Complete information as to rules concerning the construction, marking and lighting of antenna structures is contained in part 17 of this chapter.)

#### **§ 101.127 Topographical data.**

Determining the location and height above sea level of the antenna site, the elevation or contour intervals must be taken from United States Geological Survey Topographic Quadrangle Maps, United States Army Corps of Engineers maps or Tennessee Valley Authority maps, whichever is the latest, 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. Data from 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 is available, use may be made of an altimeter in a car driven along roads extending generally radially from the transmitter site. If it appears necessary, additional data may be requested. United States Geological Survey Topographic Quadrangle Maps may be obtained from the Department of the Interior, Geological Survey, Washington, DC 20242. Sectional Aeronautical Charts are available from the Department of Commerce, Coast and Geodetic Survey, Washington, DC 20230.

#### **§ 101.129 Transmitter location.**

(a) The applicant must determine, prior to filing an application for a radio station authorization, that the antenna site specified therein is adequate to render the service proposed. In cases of questionable antenna locations, it is desirable to conduct propagation tests to indicate the field intensity which may be expected in the principal areas or at the fixed points of communication to be served, particularly where severe shadow problems may be expected. In considering applications proposing the use of such locations, the Commission may require site survey tests to be made pursuant to a developmental authorization in the particular service concerned. In such cases, propagation tests should be conducted in accordance with recognized engineering methods and should be made with a transmitting antenna simulating, as near as possible, the proposed antenna installation. Full data obtained from such surveys and its analysis, including a description of the methods used and the name, address and qualifications of the engineer making the survey, must be supplied to the Commission.

(b) Antenna structures should be so located and constructed as to avoid making them hazardous to air navigation. (See part 17 of this chapter for provisions relating to antenna structures.) Such installation must be maintained in good structural condition together with any required painting or lighting.

#### **§ 101.131 Transmitter construction and installation.**

(a) The equipment at the operating and transmitting positions must be so installed and protected that it is not accessible to, or capable of being operated by, persons other than those duly authorized by the licensee.

(b) In any case where the maximum modulating frequency of a transmitter is prescribed by the Commission, the transmitter must be equipped with a low-pass or band-pass modulation filter

of suitable performance characteristics. In those cases where a modulation limiter is employed, the modulation filter must be installed between the transmitter stage in which limiting is effected and the modulated stage of the transmitter.

(c) Each transmitter employed in these services must be equipped with an appropriately labeled pilot lamp or meter which will provide continuous visual indication at the transmitter when its control circuits have been placed in a condition to activate the transmitter. In addition, facilities must be provided at each transmitter to permit the transmitter to be turned on and off independently of any remote control circuits associated therewith.

(d) At each transmitter control point the following facilities must be installed:

(1) A carrier operated device which will provide continuous visual indication when the transmitter is radiating, or, in lieu thereof, a pilot lamp or meter which will provide continuous visual indication when the transmitter control circuits have been placed in a condition to activate the transmitter; and

(2) Facilities which will permit the operator to turn transmitter carrier on and off at will.

(e) Transmitter control circuits from any control point must be so installed that grounding or shorting any line in the control circuit will not cause the transmitter to radiate: provided, however, That this provision will not be applicable to control circuits of stations which normally operate with continuous radiation or to control circuits which are under the effective operational control of responsible operating personnel 24 hours per day.

**§ 101.133 Limitations on use of transmitters.**

(a) Transmitters licensed for operation in Common Carrier services may be concurrently licensed or used for non-common carrier communication purposes. Mobile units may be concurrently licensed or used for non-common carrier communication purposes provided that the transmitter is type-accepted for use in each service.

(b) Private operational fixed point-to-point microwave stations authorized in this service may communicate with associated operational-fixed stations and fixed receivers and with units of associated stations in the mobile service licensed under Private Radio Service rule parts. In addition, intercommunication is permitted with other licensed stations and with U.S. Government stations in those cases

which require cooperation or coordination of activities or when cooperative use arrangements in accordance with § 101.135 are contemplated; provided, however, that where communication is desired with stations authorized to operate under the authority of a foreign jurisdiction, prior approval of this Commission must be obtained; And provided further, That the authority under which such other stations operate does not prohibit the intercommunication.

(c) Two or more persons or governmental entities eligible for private operational fixed point-to-point microwave licenses may use the same transmitting equipment under the following terms and conditions:

(1) Each licensee complies with the general operating requirements set out in this part;

(2) Each licensee is eligible for the frequency(ies) on which the facility operates; and

(3) Each licensee must have the ability to access the transmitter(s) that it is authorized to operate under the multiple licensing arrangement.

**§ 101.135 Shared use of radio stations and the offering of private carrier service.**

Licensees of Private Operational Fixed Point-to-Point Microwave radio stations may share the use of their facilities on a non-profit basis or may offer service on a for-profit private carrier basis, subject to the following conditions and limitations:

(a) Persons or governmental entities licensed to operate radio systems on any of the private radio frequencies set out in § 101.101 may share such systems with, or provide private carrier service to, any eligible for licensing under this part, regardless of individual eligibility restrictions, provided that the communications being carried are permissible under § 101.603. In addition, persons or governmental entities licensed to operate low power systems under the provisions of § 101.147(r)(10) may share such systems with, or provide private carrier services to, Federal Government entities, provided the communications carried are permissible under § 101.603;

(b) The licensee must maintain access to and control over all facilities authorized under its license;

(c) All sharing and private carrier arrangements must be conducted pursuant to a written agreement to be kept as part of the station records; and

(d) The licensee must keep an up-to-date list of system sharers and private carrier subscribers and the basis of their eligibility under this part. Such records must be kept current and must be made

available upon request for inspection by the Commission.

**§ 101.137 Interconnection of private operational fixed point-to-point microwave stations.**

Private operational fixed point-to-point microwave stations may be interconnected with facilities of common carriers subject to applicable tariffs.

**§ 101.139 Authorization of transmitters.**

(a) Except for transmitters used at developmental stations or for fixed point-to-point operation pursuant to subparts H and I of this part, each transmitter must be a type which has been type accepted by the Commission for use under the applicable rules of this part. Transmitters used in the private operational fixed and common carrier fixed point-to-point microwave services under subparts H and I of this part must be of a type that has been either notified or type accepted by the Commission (see § 2.904(d) of this chapter). Effective March 5, 1984, only grants of notification will be issued for transmitters used exclusively for fixed point-to-point operation. Transmitters designed for use in the 31.0 to 31.3 GHz band will be authorized under the notification procedure.

(b) Any manufacturer of a transmitter to be produced for use under the rules of this part may request type acceptance or notification by following the applicable procedures set forth in part 2 of this chapter. Type accepted and notified transmitters are included in the Commission's Radio Equipment List. Copies of this list are available for inspection at the Commission's office in Washington, DC and at each of its field offices.

(c) Type acceptance or notification for an individual transmitter may also be requested by an applicant for a station authorization, pursuant to the procedures set forth in part 2 of this chapter. An individual transmitter will not normally be included in the Radio Equipment List but will be enumerated on the station authorization.

(d) A transmitter presently shown on an instrument of authorization, which operates on an assigned frequency in the 890-940 MHz band and has not been type accepted, may continue to be used by the licensee without type acceptance provided such transmitter continues otherwise to comply with the applicable rules and regulations of the Commission.

(e) Type acceptance or notification is not required for portable transmitters operating with peak output power not greater than 250 mW. If operation of

such equipment causes harmful interference the FCC may, at its discretion, require the licensee to take such corrective action as is necessary to eliminate the interference.

(f) After July 15, 1996, the manufacture (except for export) or importation of equipment employing digital modulation techniques in the 3700–4200, 5925–6425, 6525–6875, 10,550–10,680 and 10,700–11,700 MHz bands must meet the minimum payload capacity requirements of § 101.141.

**§ 101.141 Microwave modulation.**

(a) Microwave transmitters employing digital modulation techniques and operating below 19.7 GHz must, with appropriate multiplex equipment, comply with the following additional requirements:

(1) The bit rate, in bits per second, must be equal to or greater than the bandwidth specified by the emission designator in Hertz (e.g., to be acceptable, equipment transmitting at a 20 Mb/s rate must not require a bandwidth of greater than 20 MHz),

except the bandwidth used to calculate the minimum rate may not include any authorized guard band.

Note to (a)(1): Systems authorized prior to December 1, 1988, may install equipment after that date with no minimum bit rate.

(2) Equipment to be used for voice transmission placed in service, authorized, or applied for on or before June 1, 1997 in the 2110 to 2130 and 2160 to 2180 MHz bands must be capable of satisfactory operation within the authorized bandwidth to encode at least 96 voice channels. Equipment placed in service, authorized, or applied for on or before June 1, 1997 in the 3700–4200, 5925–6425 (30 MHz bandwidth), and 10,700–11,700 MHz (30 and 40 MHz bandwidths) bands must be capable of satisfactory operation within the authorized bandwidth to encode at least 1152 voice channels. These required loading levels may be reduced by a factor of 1/N provided that N transmitters may be operated satisfactorily, over the same radio path, within an authorized

bandwidth less than, or equal to, the maximum authorizable bandwidth (e.g., the 1152 channel requirement may be reduced to 576 if two transmitters can be satisfactorily operated over the same path within the maximum bandwidth). Where type accepted equipment is designed to operate on the same frequency in a cross polarized configuration to meet the above capacity requirements, the Commission will require, at the time additional transmitters are authorized, that both polarizations of a frequency be used before a new frequency assignment is made, unless a single transmitter installation was found to be justified by the Commission at the time it authorized the first transmitter.

(3) The following capacity and loading requirements must be met for equipment applied for, authorized, and placed in service after June 1, 1997 in the 3700–4200 MHz (4 GHz), 5925–6425 and 6525–6875 MHz (6 GHz), 10,550–10,680 MHz (10 GHz), and 10,700–11,700 MHz (11 GHz) bands:

Nominal channel bandwidth (MHz)	Minimum payload capacity (Mbits/s) <sup>1</sup>	Minimum traffic loading payload (as percent of payload capacity)	Typical utilization <sup>2</sup>
0.400 .....	1.54	N/A	1 DS-1
0.800 .....	3.08	N/A	2 DS-1
1.25 .....	3.08	N/A	2 DS-1
1.60 .....	6.17	N/A	4 DS-1
2.50 .....	6.17	N/A	4 DS-1
3.75 .....	12.3	N/A	8 DS-1
5.0 .....	18.5	N/A	12 DS-1
10.0 .....	44.7	<sup>3</sup> 50	1 DS-3/STS-1
20.0 .....	89.4	<sup>3</sup> 50	2 DS-3/STS-1
30.0 (11 GHz) .....	89.4	<sup>3</sup> 50	2 DS-3/STS-1
30.0 (6 GHz) .....	134.1	<sup>3</sup> 50	3 DS-3/STS-1
40.0 .....	134.1	<sup>3</sup> 50	3 DS-3/STS-1

<sup>1</sup> Per polarization

<sup>2</sup> DS and STS refer to the number of voice circuits a channel can accommodate. 1 DS-1 = 24 voice circuits; 2 DS-1 = 48; 4 DS-1 = 96; 8 DS-1 = 192; 12 DS-1 = 288; 1 DS-3/STS-1 = 672; 2 DS-3/STS-1 = 1344; 3 DS-3/STS-1 = 2016.

<sup>3</sup> This loading requirement must be met within 30 months of licensing. If two transmitters simultaneously operate on the same frequency over the same path, the requirement is reduced to 25 percent.

(4) If a transmitter is authorized to operate in a bandwidth that is not listed in paragraph (a)(3) of this section, it must meet the minimum payload capacity and traffic loading requirements of the next largest channel bandwidth listed in the table; e.g., if the authorized bandwidth is 3.5 MHz, the minimum payload capacity must be 12.3 Mbits/s.

(5) Transmitters carrying digital motion video material are exempt from the requirements specified in paragraphs (a)(2) and (a)(3) of this section, provided that at least 50 percent

of the payload is digital video motion material and the minimum bit rate specified in paragraph (a)(1) of this section is met. In the 6, 10, and 11 GHz bands, concatenation of multiple contiguous channels is permitted for channels of equal bandwidth on center frequencies, provided no other channels are available and the minimum payload capacity requirements are met.

(6) Digital systems using bandwidths of 10 MHz or larger will be considered 50 percent loaded when the following condition is met: at least 50 percent of their total DS-1 capacity is being used.

A DS-1 channel is being used when it has been connected to a DS-0/DS-1 multiplexer. For non-DS-0 services, such as, but not limited to, video or broadband data transmission, the next largest DS-1 equivalent will be considered for the computation of a loading percentage.

(7) For digital systems, minimum payload capacities shall be expressed in numbers of DS-1s, DS-3s or STS-1s. The payload capacity required by the Commission shall correspond to commercially available equipment.

(b) For purposes of compliance with the emission limitation requirements of § 101.111(a)(2) and the requirements of paragraph (a) of this section, digital modulation techniques are considered as being employed when digital modulation occupies 50 percent or more to the total peak frequency deviation of a transmitted radio frequency carrier. The total peak frequency deviation will be determined by adding the deviation produced by the digital modulation signal and the deviation produced by any frequency division multiplex (FDM) modulation used. The deviation (D) produced by the FDM signal must be determined in accordance with § 2.202(f) of this chapter.

(c) Analog Modulation. Except for video transmission, an application for an initial working channel for a given route will not be accepted for filing where the anticipated loading (within five years for voice, or other period subject to reasonable projection) is less than the minimum specified for the following frequency bands. Absent extraordinary circumstances, applications proposing additional frequencies over existing routes will not be granted unless it is shown that the traffic load will shortly exhaust the capacity of the existing equipment. Where no construction of radio facilities is requested, licensees must submit this evidence with their filing of any necessary authority required pursuant to section 214 of the Communications Act and part 63 of this chapter.

Frequency band (MHz)	Minimum number of voice channels (4 KHz or equivalent)
3700 to 4200 (20 MHz bandwidth) .....	900
5925 to 6425 (10 MHz bandwidth) .....	300
5925 to 6425 (20 MHz bandwidth) .....	600
5925 to 6425 (30 MHz bandwidth) .....	900
6525 to 6875 (10 MHz bandwidth) .....	300
10,700 to 11,700 (10 MHz bandwidth) .....	300
10,700 to 11,700 (20 MHz bandwidth) .....	600
10,700 to 11,700 (30 MHz bandwidth) .....	900
10,700 to 11,700 (40 MHz bandwidth) .....	900

**§ 101.143 Minimum path length requirements.**

(a) The distance between end points of a fixed link in the private operational fixed point-to-point and the common

carrier fixed point-to-point microwave services must equal or exceed the value set forth in the table below or the EIRP must be reduced in accordance with the equation set forth below:

Frequency band (MHz)	Minimum path length (km)
Below 1,850 .....	N/A
1,850 to 7,125 .....	17
10,550 to 13,250 .....	5
Above 17,700 .....	N/A

(b) For paths shorter than those specified in the Table, the EIRP shall not exceed the value derived from the following equation:

$$EIRP = MAX EIRP - 40 * \log(A/B) \text{ dBW}$$

Where:

EIRP=Equivalent isotropically radiated power in dBW.

A=Minimum path length from the Table for the frequency band in kilometers.

B=The actual path length in kilometers.

Note to paragraph (b): For transmitters using Automatic Transmit Power Control, EIRP that corresponds to the maximum transmitter power must satisfy this requirement.

(c) Upon an appropriate technical showing, applicants and licensees unable to meet the minimum path length requirement may be granted an exception to these requirements.

Note to paragraph (c): Links authorized prior to April 1, 1987, need not comply with this requirement.

**§ 101.145 Interference to geostationary-satellites.**

These limitations are necessary to minimize the probability of harmful interference to reception in the bands 2655-2690 MHz, 5925-6875 MHz, and 12.7-12.75 GHz on board geostationary-space stations in the fixed-satellite service.

(a) Stations authorized prior to July 1, 1976 in the band 2655-2690 MHz, which exceed the power levels in paragraphs (a) and (b) of this section are permitted to operate indefinitely, provided that the operations of such stations does not result in harmful interference to reception in these band on board geostationary space stations.

(b) 2655 to 2690 MHz and 5925 to 6875 MHz. No directional transmitting antenna utilized by a fixed station operating in these bands may be aimed within 2 degrees of the geostationary-satellite orbit, taking into account atmospheric refraction. However, exception may be made in unusual circumstances upon a showing that there is no reasonable alternative to the

transmission path proposed. If there is no evidence that such exception would cause possible harmful interference to an authorized satellite system, said transmission path may be authorized on waiver basis where the maximum value of the equivalent isotropically radiated power (EIRP) does not exceed:

(1) +47 dBW for any antenna beam directed within 0.5 degrees of the stationary satellite orbit; or

(2) +47 to +55 dBW, on a linear decibel scale (8 dB per degree) for any antenna beam directed between 0.5 degrees and 1.5 degrees of the stationary orbit.

(c) 12.7 to 12.75 GHz. No directional transmitting antenna utilized by a fixed station operating in this band may be aimed within 1.5 degrees of the geostationary-satellite orbit, taking into account atmospheric refraction.

However, exception may be made in unusual circumstances upon a showing that there is no reasonable alternative to the transmission path proposed. If there is no evidence that such exception would cause possible harmful interference to an authorized satellite system, said transmission path may be authorized on waiver basis where the maximum value of the equivalent isotropically radiated power (EIRP) does not exceed +45 dBW for any antenna beam directed within 1.5 degrees of the stationary satellite orbit.

(d) Methods for calculating the azimuths to be avoided may be found in: CCIR Report No. 393 (Green Books), New Delhi, 1970; in "Radio-Relay Antenna Pointing for controlled Interference With Geostationary-Satellites" by C. W. Lundgren and A. S. May, Bell System Technical Journal, Vol. 48, No. 10, pp. 3387-3422, December 1969; and in "Geostationary Orbit Avoidance Computer Program" by Richard G. Gould, Common Carrier Bureau Report CC-7201, FCC, Washington, DC, 1972. This latter report is available through the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22151, in printed form (PB-211 500) or source card deck (PB-211 501).

**§ 101.147 Frequency assignments.**

(a) Frequencies in the following bands are available for assignment to fixed radio point-to-point microwave stations.

- 928.0-929.0 MHz (22)
- 932.0-932.5 MHz (27)
- 932.5-935 MHz (17)
- 941.0-941.5 MHz (17) (18)
- 941.5-944 MHz (27)
- 952.0-960.0 MHz (22)
- 1,850-1,990 MHz (22)
- 2,110-2,130 MHz (1) (3) (7) (20)
- 2,130-2,150 MHz (22)

2,150–2,160 MHz (22)  
 2,160–2,180 MHz (1) (2) (20) (21)  
 2,180–2,200 MHz (22)  
 2,450–2,500 MHz (22)  
 2,650–2,690 MHz (22)  
 3,700–4,200 MHz (8) (14) (25)  
 5,925–6,425 MHz (6) (14) (25)  
 6,425–6,525 MHz (24)  
 6,525–6,875 MHz (14)  
 10,550–10,680 MHz (19)  
 10,700–11,700 MHz (8) (9) (19) (25)  
 11,700–12,200 MHz (24)  
 12,200–12,500 MHz (22)  
 12,500–12,700 MHz (22)  
 12,700–13,200 MHz (22)  
 13,200–13,250 MHz (4) (24) (25)  
 14,200–14,400 MHz (24)  
 17,700–18,820 MHz (5) (10) (15)  
 18,820–18,920 MHz (22)  
 18,920–19,160 MHz (5) (10) (15)  
 19,160–19,260 MHz (22)  
 19,260–19,700 MHz (5) (10) (15)  
 21,200–22,000 MHz (4) (11) (12) (13) (24) (25) (26)  
 22,000–23,600 MHz (4) (11) (12) (24) (25) (26)  
 27,500–29,500 MHz (5)  
 31,000–31,300 MHz (16) (24)  
 38,600–40,000 MHz (4)  
 Bands Above 40,000 MHz

#### Notes

(1) Frequencies in this band are shared with control and repeater stations in the Domestic Public Land Mobile Radio Service and with stations in the International Fixed Public Radiocommunication Services located south of 25° 30' north latitude in the State of Florida and U. S. possessions in the Caribbean area. Additionally, the band 2160–2162 MHz is shared with stations in the Multipoint Distribution Service.

(2) Except upon showing that no alternative frequencies are available, no new assignments will be made in the band 2160–2162 MHz for stations located within 80.5 kilometers (50 miles) of the coordinates of the cities listed in § 21.901(c) of this chapter.

(3) Television transmission in this band is not authorized and radio frequency channel widths may not exceed 3.5 MHz.

(4) Frequencies in this band are shared with fixed and mobile stations licensed in other services.

(5) Frequencies in this band are shared with stations in the fixed-satellite service.

(6) These frequencies are not available for assignment to mobile earth stations.

(7) Frequencies in the band 2110–2120 MHz may be authorized on a case-by-case basis to Government or non-Government space research earth stations for telecommand purposes in connection with deep space research.

(8) This frequency band is shared with station(s) in the Local Television Transmission Service and, in the U.S. Possessions in the Caribbean area, with stations in the International Fixed Public Radiocommunications Services.

(9) The band segments 10.95–11.2 and 11.45–11.7 GHz are shared with space stations (space to earth) in the fixed-satellite service.

(10) This band is co-equally shared with stations in the fixed services under parts 74, 78 and 101 of this chapter.

(11) Frequencies in this band are shared with Government stations.

(12) Assignments to common carriers in this band are normally made in the segments 21.2–21.8 GHz and 22.4–23.8 GHz and to operational fixed users in the segments 21.8–22.4 GHz and 23.0–23.6 GHz. Assignments may be made otherwise only upon a showing that no interference free frequencies are available in the appropriate band segments.

(13) Frequencies in this band are shared with stations in the earth exploration satellite service (space to earth).

(14) Frequencies in this band are shared with stations in the fixed-satellite and private operational fixed point-to-point microwave services.

(15) Stations licensed as of September 9, 1983 to use frequencies in the 17.7–19.7 GHz band may, upon proper application, continue to be authorized for such operation.

(16) Frequencies in this band are co-equally shared with stations in the Auxiliary Broadcasting, Cable Television Relay, Private Operational Fixed Point-to-Point Microwave, and General Mobile Radio Services. Use of this spectrum for direct delivery of video programs to the general public or multi-channel cable distribution is not permitted.

(17) Frequencies in these bands are shared with Government fixed stations and stations in the Private Operational Fixed Point-to-Point Microwave Service (part 101).

(18) Frequencies in the 942 to 944 MHz band are also shared with broadcast auxiliary stations.

(19) Frequencies in this band are shared with stations in the private-operational fixed point-to-point microwave service.

(20) New facilities in these bands will be licensed only on a secondary basis. Facilities licensed or applied before January 16, 1992, are permitted to make modifications and minor extensions and retain their primary status.

(21) Any authorization of additional stations to use the 2160–2162 MHz band for Multipoint Distribution Service applied for after January 16, 1992, will be secondary to use of the band for emerging technology services.

(22) Frequencies in these bands are for the exclusive use of Private Operational Fixed Point-to-Point Microwave Service (part 101).

(23) Frequencies in these bands are for the exclusive use of Common Carrier Fixed Point-to-Point Microwave Service (part 101).

(24) Frequencies in these bands are available for assignment to television pickup and television non-broadcast pickup stations. The maximum power for the local television transmission service in the 14.2–14.4 GHz band is +45 dBW except that operations are not permitted within 1.5 degrees of the geostationary orbit.

(25) Frequencies in these bands are available for assignment to television STL stations.

(26) Frequency pairs 21.825/23.025 GHz, 21.875/23.075 GHz, 21.925/23.125 GHz, and 21.975/23.175 GHz may be authorized for low power, limited coverage, systems subject to the provisions of paragraph (s) of this section.

(27) Frequencies in the 932 to 932.5 MHz and 941 to 941.5 MHz bands are shared with

Government fixed point-to-multipoint stations and point-to-multipoint stations in the Public Land Mobile Service. Frequencies in these bands are paired with one another and are available for point-to-multipoint transmission of the licensee's products and information services, excluding video entertainment material, to the licensee's customers.

(b) Frequencies normally available for assignment in this service are set forth with applicable limitations in the following tables: *928–960 MHz* Multiple address system (MAS) frequencies are available for the point-to-multipoint transmission of a licensee's products or services, excluding video entertainment material, to a licensee's customer or for its own internal communications. The paired frequencies listed in this section are used for two-way interrogate/response communications between a master station and remote stations. Each master station operating on these frequencies is required to serve a minimum of four separate active remote stations. Ancillary one-way communications on paired frequencies are permitted on a case-by-case basis. Ancillary communications between interrelated master stations are permitted on a secondary basis. The normal channel bandwidth assigned will be 12.5 kHz. Upon adequate justification, however, channels with bandwidths up to 50 kHz may be authorized. Tables 2, 4, and 6 list frequencies with 25 kHz bandwidth channels. When licensed for a larger bandwidth, the system still is required to use equipment that meets the  $\pm 0.00015$  percent tolerance requirement. (See § 101.107). Any bandwidth (12.5 kHz, 25 kHz or greater) authorized in accordance with this section may be subdivided into narrower bandwidths to create additional (or sub) frequencies without the need to specify each discrete frequency within the specific bandwidth. Equipment that is used to create additional frequencies by narrowing bandwidth (whether authorized for a 12.5 kHz, 25 kHz or greater bandwidth) will be required to meet, at a minimum, the  $\pm 0.00015$  percent tolerance requirement so that all subfrequencies will be within the emission mask. When using subfrequencies, licensees are subject to the construction requirement of one master and four remotes per authorized bandwidth (12.5 kHz, 25 kHz or greater). Systems licensed for frequencies in these MAS bands prior to August 1, 1975, may continue to operate as authorized until June 11, 1996, at which time they must comply with current MAS operations based on the 12.5 KHz channelization set forth in this

paragraph. Systems licensed between August 1, 1975, and January 1, 1981, inclusive, are required to comply with the grandfathered 25 kHz standard bandwidth and channelization requirements set forth in this paragraph. Systems originally licensed after January 1, 1981, and on or before May 11, 1988, with bandwidths of 25 kHz and above, will be grandfathered indefinitely. (1) General Access Pool: Frequencies listed in this paragraph are available to all persons eligible under this part for use in multiple address radio systems. Except as noted, however, the frequencies may be used by eligibles in the Power Radio Service only if the frequencies in paragraph (b) (2) of this section are exhausted in the particular geographic area. The frequencies are also available for shared use by part 22 Public Land Mobile Service users if frequencies listed in § 22.50(g) of this chapter are exhausted in the particular geographic area. Applications for use of these frequencies under part 22 of this chapter are subject to part 101 requirements.

TABLE 1.—PAIRED FREQUENCIES (MHZ) [12.5 kHz bandwidth]

Remote transmit	Master transmit
928.00625	952.00625
928.01875	952.01875
928.03125	952.03125
928.04375	952.04375
928.05625	952.05625
928.06875	952.06875
928.08125	952.08125
928.09375	952.09375
928.10625	952.10625
928.11875	952.11875
928.13125	952.13125
928.14375	952.14375
928.15625	952.15625
928.16875	952.16875
928.18125	952.18125
928.19375	952.19375
928.20625	952.20625
928.21875	952.21875
928.23125	952.23125
928.24375	952.24375
928.25625	952.25625
928.26875	952.26875
928.28125	952.28125
928.29375	952.29375
928.30625	952.30625
928.31875	952.31875
928.33125	952.33125
928.34375	952.34375

UNPAIRED FREQUENCIES (MHZ) <sup>1</sup> [12.5 kHz bandwidth]

956.25625	956.33125	956.39375
956.26875	956.34375	956.40625
956.28125	956.35625	956.41875

UNPAIRED FREQUENCIES (MHZ) <sup>1</sup>—Continued [12.5 kHz bandwidth]

956.29375	956.36875	956.43125
956.30625	956.38125	956.44375
956.31875		

<sup>1</sup> Available to power eligibles regardless of whether frequencies in the power pool are exhausted.

TABLE 2.—PAIRED FREQUENCIES (MHZ) [25 kHz bandwidth]

Remote transmit	Master transmit
928.0125	952.0125
928.0375	952.0375
928.0625	952.0625
928.0875	952.0875
928.1125	952.1125
928.1375	952.1375
928.1625	952.1625
928.1875	952.1875
928.2125	952.2125
928.2375	952.2375
928.2625	952.2625
928.2875	952.2875
928.3125	952.3125
928.3375	952.3375

UNPAIRED FREQUENCIES (MHZ) <sup>1</sup> [25 kHz bandwidth]

956.2625	956.3375	956.4125
956.2875	956.3625	956.4375
956.3125	956.3875	

<sup>1</sup> Available to power eligibles regardless of whether frequencies in the power pool are exhausted.

(2) Power Pool: Frequencies listed in this paragraph are available to persons eligible under § 90.63 of this chapter for licensing in the Power Radio Service for use in multiple address radio systems. After January 1, 1992, the frequencies are also available for use by general access pool users and part 22 Public Land Mobile Service users (§ 22.501(g) of this chapter) provided frequencies listed in their respective pools are exhausted in the particular geographic area. Applications for use of these frequencies under part 22 of this chapter are subject to part 101 requirements.

TABLE 3.—PAIRED FREQUENCIES (MHZ) [12.5 kHz bandwidth]

Remote transmit	Master transmit
928.35625	952.35625
928.36875	952.36872
928.38125	952.38125
928.39375	952.39375

TABLE 3.—PAIRED FREQUENCIES (MHZ)—Continued [12.5 kHz bandwidth]

Remote transmit	Master transmit
928.40625	952.40625
928.41875	952.41875
928.43125	952.43125
928.44375	952.44375
928.45625	952.45625
928.46875	952.46875
928.48125	952.48125
928.49375	952.49375
928.50625	952.50625
928.51875	952.51875
928.53125	952.53125
928.54375	952.54375
928.55625	952.55625
928.56875	952.56875
928.58125	952.58125
928.59375	952.59375
928.60625	952.60625
928.61875	952.61875
928.63125	952.63125
928.64375	952.64375
928.65625	952.65625
928.66875	952.66875
928.68125	952.68125
928.69375	952.69375
928.70625	952.70625
928.71875	952.71875
928.73125	952.73125
928.74375	952.74375
928.75675	952.75625
928.76875	952.76875
928.78125	952.78125
928.79375	952.79375
928.80625	952.80625
928.81875	952.81875
928.83125	952.83125
928.84375	952.84375

TABLE 4.—PAIRED FREQUENCIES (MHZ) [25 kHz bandwidth]

Remote transmit	Master transmit
928.3625	952.3625
928.3875	952.3875
928.4125	952.4125
928.4375	952.4375
928.4625	952.4625
928.4875	952.4875
928.5125	952.5125
928.5375	952.5375
928.5625	952.5625
928.5875	952.5875
928.6125	952.6125
928.6375	952.6375
928.6625	952.6625
928.6875	952.6875
928.7125	952.7125
928.7375	952.7375
928.7625	952.7625
928.7875	952.7875
928.8125	952.8125
928.8375	952.8375

(3) Frequencies listed in this paragraph are available for shared use

by general access pool users for multiple address operations if frequencies listed in paragraph (b)(1) of this section are exhausted in the particular geographic area: The frequencies are also available to eligibles in the power pool provided there are no other frequencies available for the type of operation contemplated. The frequencies in this pool may be assigned for paired or unpaired operation. If paired, the corresponding lower frequency is for remote unit use. Applications for these frequencies are subject to the conditions outlined in § 22.27 of this chapter.

**TABLE 5.—PUBLIC MOBILE SERVICE CATEGORY FREQUENCIES (MHZ)**  
[12.5 kHz bandwidth]

Remote transmit	Master transmit
928.85625	959.85625
928.86875	959.86875
928.88125	959.88125
928.89375	959.89375
928.90625	959.90625
928.91875	959.91875
928.93125	959.93125
928.94375	959.94375
928.95625	959.95625
928.96875	959.96875
928.98125	959.98125
928.99375	959.99375

**TABLE 6.—PUBLIC MOBILE SERVICE CATEGORY FREQUENCIES (MHZ)**  
[25 kHz bandwidth]

Remote transmit	Master transmit
928.8625	959.8625
928.8875	959.8875
928.9125	959.9125
928.9375	959.9375
928.9625	959.9625
928.9875	959.9875

(4) Frequencies listed in this paragraph are shared with stations in the Public Land Mobile Service, part 22 of this chapter.

**TABLE 7.—PAIRED FREQUENCIES**  
[12.5 kHz bandwidth]

Remote transmit	Master transmit
932.00625	941.00625
932.01875	941.01875
932.03125	941.03125
932.04375	941.04375
932.05625	941.05625

**TABLE 7.—PAIRED FREQUENCIES—Continued**  
[12.5 kHz bandwidth]

Remote transmit	Master transmit
932.06875	941.06875
932.08125	941.08125
932.09375	941.09375
932.10625	941.10625
932.11875	941.11875
932.13125	941.13125
932.14375	941.14375
932.15625	941.15625
932.16875	941.16875
932.18125	941.18125
932.19375	941.19375
932.20625	941.20625
932.21875	941.21875
932.23125	941.23125
932.24375	941.24375
932.25625	941.25625
932.26875	941.26875
932.28125	941.28125
932.29375	941.29375
932.30625	941.30625
932.31875	941.31875
932.33125	941.33125
932.34375	941.34375
932.35625	941.35625
932.36875	941.36875
932.38125	941.38125
932.39375	941.39375
932.40625	941.40625
932.41875	941.41875
932.43125	941.43125
932.44375	941.44375
932.45625	941.45625
932.46875	941.46875
932.48125	941.48125
932.49375	941.49375

(5) Equivalent power and antenna heights for multiple address master stations:

Antenna height (AAT) in meters	Maximum effective radiated power	
	Watts	dBm
Above 305	200	53
Above 274 to 305	250	54
Above 244 to 274	315	55
Above 213 to 244	400	56
Above 182 to 213	500	57
Above 152.5 to 182	630	58
152.5 and below	1,000	60

For mobile operations the maximum ERP is 25 watts (44 dBm).

(6) Fixed point-to-point frequencies.

**TABLE 8.—PAIRED FREQUENCIES**

[All frequencies may be used by Common Carrier Fixed Point-to-Point and Private Operational Fixed Point-to-Point Microwave Service licensees; 25 kHz bandwidth]

Transmit (receive) (MHz)	Receive (transmit) (MHz)
932.5125	941.5125
932.5375	941.5375
932.5625	941.5625
932.5875	941.5875
932.6125	941.6125
932.6375	941.6375
932.6625	941.6625
934.8375	943.8375
934.8625	943.8625
934.8875	943.8875
934.9125	943.9125
934.9375	943.9375
934.9625	943.9625
934.9875	943.9875

**TABLE 9.—PAIRED FREQUENCIES**

[Frequencies may be used only by Private Operational Fixed Point-to-Point Microwave Service licensees, unless otherwise noted; 50 kHz bandwidth]

Transmit (receive) (MHz)	Receive (transmit) (MHz)
932.70 <sup>1</sup>	941.70
932.75 <sup>1</sup>	941.75
934.80 <sup>1</sup>	943.80
956.65	953.05
956.75	953.15
956.85	953.25
956.95	953.35
957.05	953.45
957.25	953.65
957.35	953.75
957.45	953.85
957.65	954.05
957.75	954.15
957.85	954.25
958.05	954.45
958.15	954.55
958.25	954.65
958.45	954.85
958.55	954.95
958.65	955.05
958.85	955.25
958.95	955.35
959.05	955.45
959.25	955.65
959.35	955.75
959.45	955.85
959.55	955.95
959.65	956.05

<sup>1</sup> These frequencies also may be used by Common Carrier Fixed Point-to-Point Microwave licensees.

TABLE 10.—PAIRED FREQUENCIES

[Frequencies may be used only by Private Operational Fixed Point-to-Point Microwave licensees, unless otherwise noted; 100 kHz bandwidth]

Transmit (receive) (MHz)	Receive (transmit) (MHz)
932.8250 <sup>1</sup>	1941.8250
932.9250 <sup>1</sup>	1941.9250
933.0250 <sup>1</sup>	1942.0250
934.5250 <sup>1</sup>	1943.5250
934.6250 <sup>1</sup>	1943.6250
934.7250 <sup>1</sup>	1943.7250
956.6	953.0
956.7	953.1
956.8	953.2
956.9	953.3
957.0	953.4
957.1	953.5
957.2	953.6
957.3	953.7
957.4	953.8
957.5	953.9
957.6	954.0
957.7	954.1
957.8	954.2
957.9	954.3
958.0	954.4
958.1	954.5
958.2	954.6
958.3	954.7
958.4	954.8
958.5	954.9
958.6	955.0
958.7	955.1
958.8	955.2
958.9	955.3
959.0	955.4
959.1	955.5
959.2	955.6
959.3	955.7
959.4	955.8
959.5	955.9
959.6	956.0
959.7	956.1

<sup>1</sup>These frequencies also may be used by Common Carrier Fixed Point-to-Point Microwave licensees.

TABLE 11.—PAIRED FREQUENCIES

[Frequencies may be used only by Private Operational Fixed Point-to-Point Microwave licensees, unless otherwise noted; 200 kHz bandwidth]

Transmit (receive) (MHz)	Receive (transmit) (MHz)
933.1750 <sup>1</sup>	1942.1750
933.3750 <sup>1</sup>	1942.3750
933.5750 <sup>1</sup>	1942.5750
933.7750 <sup>1</sup>	1942.7750
933.9750 <sup>1</sup>	1942.9750
933.1750 <sup>1</sup>	1943.1750
933.3750 <sup>1</sup>	1943.3750
957.15	953.55
957.55	953.95
957.95	954.35
958.35	954.75
958.75	955.15

TABLE 11.—PAIRED FREQUENCIES—Continued

[Frequencies may be used only by Private Operational Fixed Point-to-Point Microwave licensees, unless otherwise noted; 200 kHz bandwidth]

Transmit (receive) (MHz)	Receive (transmit) (MHz)
959.15	955.55

<sup>1</sup>These frequencies also may be used by Common Carrier Fixed Point-to-Point Microwave licensees.

- (c) 1850–1990 MHz.
- (1) 10 MHz maximum bandwidth.

PAIRED FREQUENCIES

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1855	1935
1865	1945
1875	1955
1885	1965
1895	1975
1905	1985

UNPAIRED FREQUENCIES

- 1915<sup>1</sup>
- 1925<sup>1</sup>

<sup>1</sup>Available for systems employing one-way transmission.

- (2) 5 MHz maximum bandwidth.

PAIRED FREQUENCIES

Transmit (receive) (MHz)	Receive (transmit) (MHz)
1860	1940
1870	1950
1880	1960
1890	1970
1900	1980

- (d) 2130–2150 MHz; 2180–2200 MHz; 800 kHz maximum bandwidth, unless noted.

PAIRED FREQUENCIES

2130–2150		2180–2200	
Transmit (receive) (MHz)	Receive (transmit) (MHz)	Transmit (receive) (MHz)	Receive (transmit) (MHz)
2130.8	2180.8	2180.8	2180.8
2131.6	2181.6	2181.6	2181.6
2132.4	2182.4	2182.4	2182.4
2133.2	2183.2	2183.2	2183.2
2134.0	2184.0	2184.0	2184.0
2134.8	2184.8	2184.8	2184.8
2135.6	2185.6	2185.6	2185.6
2136.4	2186.4	2186.4	2186.4
2137.2	2187.2	2187.2	2187.2

Transmit (receive) (MHz)	Receive (transmit) (MHz)
2138.0	2188.0
2139.6	2189.6
2138.8	2188.8
2140.4	2190.4
2141.2	2191.2
2142.0	2192.0
2142.8	2192.8
2143.6	2193.6
2144.4	2194.4
2145.2	2195.2
2146.0	2196.0
2146.8	2196.8
2147.6	2197.6
2148.4	2198.4
2149.2	2199.2

<sup>1</sup>Consideration will be given on a case-by-case basis to assigning these frequency pairs to systems employing 1600 KHz bandwidth transmissions.

(e) 2150–2160 MHz: Specific frequency of operation to be set forth in authorization. Omnidirectional transmission only may be authorized, subject to providing protection from harmful interference to previously authorized stations in this service and in other services sharing this band.

(f) 2450–2500 MHz:

(1) This band is shared with other communications services and is not subject to protection from interference from industrial, scientific, and medical devices operating on 2450 MHz.

(2) Stations licensed in this band under this part prior to March 1, 1996, are grandfathered and may continue their authorized operations. Stations licensed in the 2483.5–2500 MHz portion of the band as of July 25, 1985, or on a subsequent date as a result of submitting an application on or before July 25, 1985, are grandfathered, and may continue operations, subject only to license renewal, on a co-primary basis with the Radiodetermination Satellite Service.

(3) 625 KHz bandwidth channels. The normal bandwidth authorized will be 625 KHz. Upon adequate justification, additional contiguous channels may be authorized to provide up to a 2500 KHz bandwidth.

PAIRED FREQUENCIES

Transmit (receive) (MHz)	Receive (transmit) (MHz)
2450.3125	2467.5625
2450.9375	2468.1875
2451.5625	2468.8125
2452.1875	2469.4375
2452.8125	2470.0625
2453.4375	2470.6875
2454.0625	2471.3125
2454.6875	2471.9375
2455.3125	2472.5625

PAIRED FREQUENCIES—Continued

Transmit (receive) (MHz)	Receive (transmit) (MHz)
2455.9375	2473.1875
2456.5625	2473.8125
2457.1875	2474.4375
2457.8125	2475.0625
2458.4375	2475.6875
2459.0625	2476.3125
2459.6875	2476.9375
2460.3125	2477.5625
2460.9375	2478.1875
2461.5625	2478.8125
2462.1875	2479.4375
2462.8125	2480.0625
2463.4375	2480.6875
2464.0625	2481.3125
2464.6875	2481.9375
2465.3125	2482.5625
2465.9375	2483.1875

(g) 2500–2690 MHz: Operational-fixed stations may be authorized on the following frequencies:

FREQUENCIES (MHz)

2686.9375
2687.9375
2688.5625
2688.6875
2688.9375
2689.5625
2689.6875

Note to (g): Operational-Fixed stations authorized in this band as of July 16, 1971, which do not comply with the provisions of this part may continue to operate on the frequencies assigned on a coequal basis with other stations operating in accordance with the Table of Frequency allocations. Requests for subsequent license renewals or modifications for such stations will be considered. However, expansion of systems comprised of such stations will not be permitted, except pursuant to the provisions of this part. No new licenses will be issued under this part until specific operating parameters are established for this band.

(h) 3,700 to 4,200 MHz: 20 MHz maximum authorized bandwidth. 20 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
3710	3750
3730	3770
3790	3830
3810	3850
3870	3910
3890	3930
3950	3990
3970	4010
4030	4070
4050	4090
4110	4150
4130	4170

Transmit (receive) (MHz)	Receive (transmit) (MHz)
N/A	14190

<sup>1</sup>This frequency may be assigned for unpaired use.

(i) 5,925 to 6,425 MHz: 30 MHz authorized bandwidth.

(1) 400 kHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
5925.225	6177.100
5925.625	6177.500
5926.050	6177.925
5926.450	6178.325
5926.875	6178.750
5927.275	6179.150
5927.725	6179.600
5928.125	6180.000
5928.550	6180.425
5928.950	6180.825
5929.375	6181.250
5929.775	6181.650
6168.350	6420.225
6168.750	6420.625
6169.175	6421.050
6169.575	6421.450
6170.000	6421.875
6170.400	6422.275
6170.850	6422.725
6171.250	6423.125
6171.675	6423.550
6172.075	6423.950
6172.500	6424.375
6172.900	6424.775

(2) 800 kHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
5925.425	6177.300
5926.250	6178.125
5927.075	6178.950
5927.925	6179.800
5928.750	6180.625
5929.575	6181.450
6168.550	6420.425
6169.375	6421.250
6170.200	6422.075
6171.050	6422.925
6171.875	6423.750
6172.700	6424.575

(3) 1.25 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
5925.625	6177.500
5926.875	6178.750
5928.125	6180.000
5929.375	6181.250
6108.893	6360.933
6110.128	6362.168
6111.364	6363.404
6112.599	6364.639
6113.834	6365.874
6115.070	6367.110

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6116.305	6368.345
6117.541	6369.581
6118.776	6370.816
6120.011	6372.051
6121.247	6373.287
6122.482	6374.522
6123.718	6375.758
6124.953	6376.993
6126.189	6378.229
6127.424	6379.464
6128.659	6380.699
6129.895	6381.935
6131.130	6383.170
6132.366	6384.406
6133.601	6385.641
6134.836	6386.876
6136.072	6388.112
6137.307	6389.347
6138.543	6390.583
6139.778	6391.818
6141.014	6393.054
6142.249	6394.289
6143.484	6395.524
6144.720	6396.760
6145.955	6397.995
6147.191	6399.231
6148.426	6400.466
6149.661	6401.701
6150.897	6402.937
6152.132	6404.172
6153.368	6405.408
6154.603	6406.643
6155.839	6407.879
6157.074	6409.114
6158.309	6410.349
6159.545	6411.585
6160.780	6412.820
6162.016	6414.056
6163.251	6415.291
6164.486	6416.526
6165.722	6417.762
6166.957	6418.997
6168.192	6420.232
6170.000	6421.875
6171.250	6423.125
6172.500	6424.375
6173.750 <sup>1</sup>	N/A
6175.000 <sup>1</sup>	N/A
6176.250 <sup>1</sup>	N/A

<sup>1</sup>These frequencies may be assigned for unpaired use.

(4) 2.5 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
5926.250	6178.125
5928.750	6180.625
6109.510	6361.550
6111.981	6364.021
6114.452	6366.492
6116.923	6368.963
6119.394	6371.434
6121.865	6373.905
6124.335	6376.375
6126.806	6378.846
6129.277	6381.317
6131.748	6383.788
6134.219	6386.259
6136.690	6388.730

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6139.160	6391.200
6141.631	6393.671
6144.102	6396.142
6146.573	6398.613
6149.044	6401.084
6151.515	6403.555
6153.985	6406.025
6156.456	6408.496
6158.927	6410.967
6161.398	6413.438
6163.869	6415.909
6166.340	6418.380
6169.375	6421.250
6171.875	6423.750
6175.625 <sup>1</sup>	N/A

<sup>1</sup> This frequency may be assigned for unpaired use.

(5) 3.75 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6111.364	6363.404
6116.305	6368.345
6121.247	6373.287
6126.189	6378.229
6131.130	6383.170
6136.072	6388.112
6141.014	6393.054
6145.955	6397.995
6150.897	6402.937
6155.839	6407.879
6160.780	6412.820
6165.722	6417.762
6175.000 <sup>1</sup>	N/A

<sup>1</sup> This frequency may be assigned for unpaired use.

(6) 5 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6110.75	6362.79
6115.69	6367.73
6120.63	6372.67
6125.57	6377.61
6130.51	6382.55
6135.45	6387.49
6140.40	6392.44
6145.34	6397.38
6150.28	6402.32
6155.22	6407.26
6160.16	6412.20
6165.10	6417.14

(7) 10 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
5935.32	6187.36
5945.20	6197.24
5955.08	6207.12
5964.97	6217.01
5974.85	6226.89
5984.73	6236.77
5994.62	6246.66

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6004.50	6256.54
6014.38	6266.42
6024.27	6276.31
6034.15	6286.19
6044.03	6296.07
6053.92	6305.96
6063.80	6315.84
6073.68	6325.72
6083.57	6335.61
6093.45	6345.49
6103.33	6355.37
6113.22 <sup>1</sup>	<sup>1</sup> 6365.26
6123.10 <sup>1</sup>	<sup>1</sup> 6375.14
6132.98 <sup>1</sup>	<sup>1</sup> 6385.02
6142.87 <sup>1</sup>	<sup>1</sup> 6394.91
6152.75 <sup>1</sup>	<sup>1</sup> 6404.79
6162.63 <sup>1</sup>	<sup>1</sup> 6414.67

<sup>1</sup> Alternate channels. These channels are set aside for narrow bandwidth systems and should be used only if all other channels are blocked.

(8) 30 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
5945.20	6197.24
5974.85	6226.89
6004.50	6256.54
6034.15	6286.19
6063.80	6315.84
6093.45	6345.49
6123.10 <sup>1</sup>	<sup>1</sup> 6375.14
6152.75 <sup>1</sup>	<sup>1</sup> 6404.79

<sup>1</sup> Alternate channels. These channels are set aside for narrow bandwidth systems and should be used only if all other channels are blocked.

(j) 6,425 to 6,525 MHz: Mobile. Paired and unpaired operations permitted. Use of this spectrum for direct delivery of video programs to the general public or multi-channel cable distribution is not permitted. This band is co-equally shared with mobile stations licensed pursuant to parts 21, 74, and 78 of this chapter. Stations not intended to be operated while in motion will be licensed under the provision of § 101.13(b). The following channel plans apply.

(1) 1 MHz maximum authorized bandwidth channels:

Transmit (or receive) (MHz)	Receive (or transmit) (MHz)
6425.5	6475.5
6450.5	6500.5

(2) 8 MHz maximum authorized bandwidth channels:

Transmit (or receive) (MHz)	Receive (or transmit) (MHz)
6430.0	6480.0
6438.0	6488.0
6446.0	6596.0
6455.0	6505.0
6463.0	6513.0
6471.0	6521.0

(3) 25 MHz maximum authorized bandwidth channels:

Transmit (or receive) (MHz)	Receive (or transmit) (MHz)
6437.5	6487.5
6462.5	6512.5

(k) On the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations, persons holding valid station authorizations on July 15, 1963, to provide television nonbroadcast pickup service in the 6525–6575 MHz band may be authorized to continue use of the frequencies specified in their authorization for such operations until July 15, 1968.

(l) 6,525 to 6,875 MHz. 10 MHz authorized bandwidth.

(1) 400 kHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6525.225	6870.225
6525.625	6870.625
6526.050	6871.050
6526.450	6871.450
6526.875	6871.875
6527.275	6872.275
6527.725	6872.725
6528.125	6873.125
6528.550	6873.550
6528.950	6873.950
6529.375	6874.375
6529.775	6874.775

(2) 800 kHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6525.425	6870.425
6526.250	6871.250
6527.075	6872.075
6527.925	6872.925
6528.750	6873.750
6529.575	6874.575

(3) 1.25 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6525.625	6870.625



Transmit (receive) (MHz)	Receive (transmit) (MHz)
6550.625	6730.625
6555.625 <sup>1</sup>	6725.625 <sup>1</sup>
6560.625	6740.625
6565.625	6735.625
6585.625	6745.625
6590.625	6750.625
6595.625	6755.625
6600.625	6760.625
6605.625	6765.625
6610.625	6770.625
6615.625	6775.625
6620.625	6780.625
6625.625	6785.625
6630.625	6790.625
6635.625	6795.625
6640.625	6800.625
6645.625	6805.625
6650.625	6810.625
6655.625	6815.625
6660.625	6820.625
6665.625	6825.625
6670.625	6830.625
6675.625	6835.625
6680.625	6840.625
6685.625	6845.625
6690.625	6850.625
6695.625	6855.625
6700.625	6860.625
6705.625	6865.625
6710.625 <sup>1</sup>	6720.625

<sup>1</sup>These frequencies may be assigned for unpaired use.

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6545 <sup>1</sup>	16715
6550	6730
6555 <sup>1</sup>	16725
6560	6740
6565	6735
6585	6745
6590	6750
6595	6755
6600	6760
6605	6765
6610	6770
6615	6775
6620	6780
6625	6785
6630	6790
6635	6795
6640	6800
6645	6805
6650	6810
6655	6815
6660	6820
6665	6825
6670	6830
6675	6835
6680	6840
6685	6845
6690	6850
6695	6855
6700	6860
6705	6865
6710 <sup>1</sup>	16720

<sup>1</sup>These frequencies may be assigned for unpaired use.

(7) 10 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6545 <sup>1</sup>	16715
6555 <sup>1</sup>	16725
6565	6735
6585	6745
6595	6755
6605	6765
6615	6775
6625	6785
6635	6795
6645	6805
6655	6815
6665	6825
6675	6835
6685	6845
6695	6855
6705	6865
6535 <sup>2</sup>	26575

<sup>1</sup>These frequencies may be assigned for unpaired use.  
<sup>2</sup>Available only for emergency restoration, maintenance bypass, or other temporary-fixed purposes. Such uses are authorized on a non-interference basis to other frequencies in this band. Interference analysis required by §101.105 does not apply to this frequency pair.

(m) 10,550 to 10,680 MHz. 5 MHz authorized bandwidth.

(1) 400 kHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10605.225	10670.225
10605.625	10670.625
10606.050	10671.050
10606.450	10671.450
10606.875	10671.875
10607.275	10672.275
10607.725	10672.725
10608.125	10673.125
10608.550	10673.550
10608.950	10673.950
10609.375	10674.375
10609.775	10674.775
10610.225	10675.225
10610.625	10675.625
10611.050	10676.050
10611.450	10676.450
10611.875	10676.875
10612.275	10677.275
10612.725	10677.725
10613.125	10678.125
10613.550	10678.550
10613.950	10678.950
10614.375	10679.375
10614.775	10679.775

(2) 800 kHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10605.425	10670.425
10606.250	10671.250
10607.075	10672.075
10607.925	10672.925
10608.750	10673.750

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10609.575	10674.575
10610.425	10675.425
10611.250	10676.250
10612.075	10677.075
10612.925	10677.925
10613.750	10678.750
10614.575	10679.575

(3) 1.25 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10550.625	10615.625
10551.875	10616.875
10553.125	10618.125
10554.375	10619.375
10555.625	10620.625
10556.875	10621.875
10558.125	10623.125
10559.375	10624.375
10560.625	10625.625
10561.875	10626.875
10563.125	10628.125
10564.375	10629.375
10565.625	10630.625
10566.875	10631.875
10568.125	10633.125
10569.375	10634.375
10570.625	10635.625
10571.875	10636.875
10573.125	10638.125
10574.375	10639.375
10575.625	10640.625
10576.875	10641.875
10578.125	10643.125
10579.375	10644.375
10580.625	10645.625
10581.875	10646.875
10583.125	10648.125
10584.375	10649.375
10585.625	10650.625
10586.875	10651.875
10588.125	10653.125
10589.375	10654.375
10590.625	10655.625
10591.875	10656.875
10593.125	10658.125
10594.375	10659.375
10595.625	10660.625
10596.875	10661.875
10598.125	10663.125
10599.375	10664.375
10600.625	10665.625
10601.875	10666.875
10603.125	10668.125
10604.375	10669.375
10605.625	10670.625
10606.875	10671.875
10608.125	10673.125
10609.375	10674.375
10610.625	10675.625
10611.875	10676.875
10613.125	10678.125
10614.375	10679.375

(4) 2.5 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10551.25	10616.25
10553.75	10618.75
10556.25	10621.25
10558.75	10623.75
10561.25	10626.25
10563.75	10628.75
10566.25	10631.25
10568.75	10633.75
10571.25	10636.25
10573.75	10638.75
10576.25	10641.25
10578.75	10643.75
10581.25 <sup>1</sup>	<sup>1</sup> 10646.25
10583.75 <sup>1</sup>	<sup>1</sup> 10648.75
10586.25 <sup>1</sup>	<sup>1</sup> 10651.25
10588.75 <sup>1</sup>	<sup>1</sup> 10653.75
10591.25 <sup>1</sup>	<sup>1</sup> 10656.25
10593.75 <sup>1</sup>	<sup>1</sup> 10658.75
10596.25 <sup>1</sup>	<sup>1</sup> 10661.25
10598.75 <sup>1</sup>	<sup>1</sup> 10663.75
10601.25 <sup>1</sup>	<sup>1</sup> 10666.25
10603.75 <sup>1</sup>	<sup>1</sup> 10668.75
10606.25 <sup>1</sup>	<sup>1</sup> 10671.25
10608.75 <sup>1</sup>	<sup>1</sup> 10673.75
10611.25 <sup>1</sup>	<sup>1</sup> 10676.25
10613.75 <sup>1</sup>	<sup>1</sup> 10678.75

<sup>1</sup>These frequencies are also available for DEMS stations licensed, in operation, or applied for prior to July 15, 1993.

(5) 3.75 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10553.125	10618.125
10558.125	10623.125
10563.125	10628.125
10568.125	10633.125
10573.125	10638.125
10578.125	10643.125
10583.125	10648.125
10588.125	10653.125
10593.125	10658.125
10598.125	10663.125
10603.125	10668.125

(6) 5 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10552.5	10617.5
10557.5	10622.5
10562.5	10627.5
10567.5 <sup>1</sup>	<sup>1</sup> 10632.5
10572.5 <sup>1</sup>	<sup>1</sup> 10637.5
10577.5 <sup>1</sup>	<sup>1</sup> 10642.5
10582.5 <sup>1</sup>	<sup>1</sup> 10647.5
10587.5	10652.5
10592.5	10657.5
10597.5	10662.5
10602.5	10667.5

<sup>1</sup>These frequencies are also available for DEMS stations licensed, in operation, or applied for prior to July 15, 1993.

(n) Point-to-multipoint systems licensed, in operation, or applied for in the 10,550–10,680 MHz band prior to

July 15, 1993, are permitted to use the DEMS frequencies noted above if they prior coordinate such usage with the necessary parties including 10 GHz point-to-point applicants and licensees. DEMS Nodal Stations shall use the band 10,565–10,615 MHz while DEMS User Stations shall use the band 10,630–10,680 MHz.  
 (o) 10,700 to 11,700 MHz. 40 MHz authorized bandwidth.  
 (1) 1.25 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
11130.625	11620.625
11131.875	11621.875
11133.125	11623.125
11134.375	11624.375
11135.625	11625.625
11136.875	11626.875
11138.125	11628.125
11139.375	11629.375
11140.625	11630.625
11141.875	11631.875
11143.125	11633.125
11144.375	11634.375
11145.625	11635.625
11146.875	11636.875
11148.125	11638.125
11149.375	11639.375
11150.625	11640.625
11151.875	11641.875
11153.125	11643.125
11154.375	11644.375
11155.625	11645.625
11156.875	11646.875
11158.125	11648.125
11159.375	11649.375
11160.625	11650.625
11161.875	11651.875
11163.125	11653.125
11164.375	11654.375
11165.625	11655.625
11166.875	11656.875
11168.125	11658.125
11169.375	11659.375
11170.625	11660.625
11171.875	11661.875
11173.125	11663.125
11174.375	11664.375
11175.625	11665.625
11176.875	11666.875
11178.125	11668.125
11179.375	11669.375
11180.625	11680.625
11181.875	11681.875
11183.125	11683.125
11184.375	11684.375
11185.625	11685.625
11186.875	11686.875
11188.125	11688.125
11189.375	11689.375
11190.625	11690.625
11191.875	11691.875
11193.125	11693.125
11194.375	11694.375
11195.625	11695.625
11196.875	11696.875
11198.125	11698.125
11199.375	11699.375

(2) 2.5 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
11131.25	11621.25
11133.75	11623.75
11136.25	11626.25
11138.75	11628.75
11141.25	11631.25
11143.75	11633.75
11146.25	11636.25
11148.75	11638.75
11151.25	11641.25
11153.75	11643.75
11156.25	11646.25
11158.75	11648.75
11161.25	11651.25
11163.75	11653.75
11166.25	11656.25
11168.75	11658.75
11171.25	11661.25
11173.75	11663.75
11176.25	11666.25
11178.75	11668.75
11181.25	11681.25
11183.75	11683.75
11186.25	11686.25
11188.75	11688.75
11191.25	11691.25
11193.75	11693.75
11196.25	11696.25
11198.75	11698.75

(3) 3.75 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
11133.125	11623.125
11138.125	11628.125
11143.125	11633.125
11148.125	11638.125
11153.125	11643.125
11158.125	11648.125
11163.125	11653.125
11168.125	11658.125
11173.125	11663.125
11178.125	11668.125
11183.125	11683.125
11188.125	11688.125
11193.125	11693.125
11198.125	11698.125

(4) 5 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
11132.5	11622.5
11137.5	11627.5
11142.5	11632.5
11147.5	11637.5
11152.5	11642.5
11157.5	11647.5
11162.5	11652.5
11167.5	11657.5
11172.5	11662.5
11177.5	11667.5
11182.5	11682.5
11187.5	11687.5
11192.5	11692.5
11197.5	11697.5

(5) 10 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)	Transmit (receive) (MHz)	Receive (transmit) (MHz)
10705 .....	11205	11115 .....	11605
10715 .....	11215	11155 <sup>1</sup> .....	<sup>1</sup> 11645
10725 <sup>2</sup> .....	<sup>1</sup> 11675	11185 <sup>1</sup> .....	<sup>1</sup> 11685
10735 .....	11225	<sup>1</sup> Alternate channels. These channels are set aside for narrow bandwidth systems and should be used only if all other channels are blocked.	
10745 .....	11235	<b>(7) 40 MHz bandwidth channels:<sup>2</sup></b>	
10755 .....	11245		
10765 .....	11255		
10775 .....	11265		
10785 .....	11275		
10795 .....	11285		
10805 .....	11295		
10815 .....	11305		
10825 .....	11315		
10835 .....	11325		
10845 .....	11335	10735 .....	11225
10855 .....	11345	10775 .....	11265
10865 .....	11355	10815 .....	11305
10875 .....	11365	10855 .....	11345
10885 .....	11375	10895 .....	11385
10895 .....	11385	10935 .....	11425
10905 .....	11395	10975 .....	11465
10915 .....	11405	11015 .....	11505
10925 .....	11415	11055 .....	11545
10935 .....	11425	11095 .....	11585
10945 .....	11435	11135 <sup>1</sup> .....	<sup>1</sup> 11625
10955 .....	11445	11175 <sup>1</sup> .....	<sup>1</sup> 11665
10965 .....	11455	<sup>1</sup> Alternate channels. These channels are set aside for narrow bandwidth systems and should be used only if all other channels are blocked.	
10975 .....	11465	<sup>2</sup> In congested areas where 40 MHz channels block most 30 MHz channels, radios authorized for 30 MHz bandwidths may use the 40 MHz channels. In uncongested areas, 30 MHz channels should be used.	
10985 .....	11475	<b>(p) 12,000-12700 MHz:</b> The Commission has allocated the 12.2-12.7 GHz band for use by the broadcasting-satellite service. Private operational fixed point-to-point microwave stations authorized after September 9, 1983, will be licensed on a noninterference basis and are required to make any and all adjustments necessary to prevent interference to operating domestic broadcasting-satellite systems. Notwithstanding any other provisions, no private operational fixed point-to-point microwave stations are permitted to cause interference to broadcasting-satellite stations of other countries operating in accordance with the Region 2 plan for the broadcasting-satellite service established at the 1983 WARC.	
10995 .....	11485	<b>(q) Special provisions for low power, limited coverage systems in the band segments 12.2-12.7 GHz.</b> Notwithstanding any contrary provisions in this part the frequency pairs 12.220/12.460 GHz, 12.260/12.500 GHz, 12.300/12.540 GHz and 12.340/12.580 GHz may be authorized for low power, limited coverage systems subject to the following provisions:	
11005 .....	11495	<b>(1) Maximum equivalent isotropically radiated power (EIRP) shall be 55 dBm;</b>	
11015 .....	11505	<b>(2) The rated transmitter output power shall not exceed 0.500 watts;</b>	
11025 .....	11515		
11035 .....	11525		
11045 .....	11535		
11055 .....	11545		
11065 .....	11555		
11075 .....	11565		
11085 .....	11575		
11095 .....	11585		
11105 .....	11595		
11115 .....	11605		
11125 .....	11615		
11135 <sup>1</sup> .....	<sup>1</sup> 11625		
11145 <sup>1</sup> .....	<sup>1</sup> 11635		
11155 <sup>1</sup> .....	<sup>1</sup> 11645		
11165 <sup>1</sup> .....	<sup>1</sup> 11655		
11175 <sup>1</sup> .....	<sup>1</sup> 11665		
11185 <sup>1</sup> .....	<sup>1</sup> 11685		
11195 <sup>1</sup> .....	<sup>1</sup> 11695		

<sup>1</sup> Alternate channels. These channels are set aside for narrow bandwidth systems and should be used only if all other channels are blocked.

<sup>2</sup> These frequencies may be assigned for unpaired use.

**(6) 30 MHz bandwidth channels:**

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10715 .....	11215
10755 .....	11245
10795 .....	11285
10835 .....	11325
10875 .....	11365
10915 .....	11405
10955 .....	11445
10995 .....	11485
11035 .....	11525
11075 .....	11565

(3) Frequency tolerance shall be maintained to within 0.01 percent of the assigned frequency;

(4) Maximum beamwidth not to exceed 4 degrees. However, the sidelobe suppression criteria contained in § 101.115 of this part shall not apply, except that a minimum front-to-back ratio of 38 dB shall apply;

(5) Upon showing of need, a maximum bandwidth of 12 MHz may be authorized per frequency assigned;

(6) Radio systems authorized under the provisions of this section shall have no more than three hops in tandem, except upon showing of need, but in any event the maximum tandem length shall not exceed 40 km (25 miles);

(7) Interfering signals at the receiver antenna terminals of stations authorized under this section shall not exceed -90 dBm and -70 dBm respectively, for co-channel and adjacent channel interfering signals, and

(8) Stations authorized under the provisions of this section shall provide the protection from interference specified in § 101.105 to stations operating in accordance with the provisions of this part.

**(r) 17,700 to 19,700 MHz:** Applicants may use either a two-way link or one frequency of a frequency pair for a one-way link and must coordinate proposed operations pursuant to the procedures required in § 101.103. (Note, however, that stations authorized as of September 9, 1983, to use frequencies in the band 17.7-19.7 GHz may, upon proper application, continue to be authorized for such operations.)

(1) 2 MHz maximum authorized bandwidth channel:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
18141.0 .....	N/A

(2) 5 MHz maximum authorized bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
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**340 MHz Separation**

18762.5 .....	19102.5
18767.5 .....	19107.5
18772.5 .....	19112.5
18777.5 .....	19117.5
18782.5 .....	19122.5
18787.5 .....	19127.5
18792.5 .....	19132.5
18797.5 .....	19137.5
18802.5 .....	19142.5
18807.5 .....	19147.5
18812.5 .....	19152.5
18817.5 .....	19157.5

(3) 6 MHz maximum authorized bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
<b>216 MHz Separation</b>	
18145.0 .....	N/A
18151.0 .....	18367.0
18157.0 .....	18373.0
18163.0 .....	18379.0
18169.0 .....	18385.0
18175.0 .....	18391.0
18181.0 .....	18397.0
18187.0 .....	18403.0
18193.0 .....	18409.0
18199.0 .....	18415.0
18205.0 .....	18421.0
18211.0 .....	18427.0
18217.0 .....	18433.0
18223.0 .....	18439.0
18229.0 .....	18445.0
18235.0 .....	18451.0
18241.0 .....	18457.0
18247.0 .....	18463.0
18253.0 .....	18469.0
18259.0 .....	18475.0
18265.0 .....	18481.0
18271.0 .....	18487.0
18277.0 .....	18493.0
18283.0 .....	18499.0
18289.0 .....	18505.0
18295.0 .....	18511.0
18301.0 .....	18517.0
18307.0 .....	18523.0
18313.0 .....	18529.0
18319.0 .....	18535.0
18325.0 .....	18541.0
18331.0 .....	18547.0
18337.0 .....	18553.0
18343.0 .....	18559.0
18349.0 .....	18565.0
18355.0 .....	18571.0
18361.0 .....	18577.0

(4) 10 MHz maximum authorized bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
<b>1560 MHz Separation</b>	
17705.0 .....	19265.0
17715.0 .....	19275.0
17725.0 .....	19285.0
17735.0 .....	19295.0
17745.0 .....	19305.0
17755.0 .....	19315.0
17765.0 .....	19325.0
17775.0 .....	19335.0
17785.0 .....	19345.0
17795.0 .....	19355.0
17805.0 .....	19365.0
17815.0 .....	19375.0
17825.0 .....	19385.0
17835.0 .....	19395.0
17845.0 .....	19405.0
17855.0 .....	19415.0
17865.0 .....	19425.0
17875.0 .....	19435.0
17885.0 .....	19445.0
17895.0 .....	19455.0

Transmit (receive) (MHz)	Receive (transmit) (MHz)
17905.0 .....	19465.0
17915.0 .....	19475.0
17925.0 .....	19485.0
17935.0 .....	19495.0
17945.0 .....	19505.0
17955.0 .....	19515.0
17965.0 .....	19525.0
17975.0 .....	19535.0
17985.0 .....	19545.0
17995.0 .....	19555.0
18005.0 .....	19565.0
18015.0 .....	19575.0
18025.0 .....	19585.0
18035.0 .....	19595.0
18045.0 .....	19605.0
18055.0 .....	19615.0
18065.0 .....	19625.0
18075.0 .....	19635.0
18085.0 .....	19645.0
18095.0 .....	19655.0
18105.0 .....	19665.0
18115.0 .....	19675.0
18125.0 .....	19685.0
18135.0 .....	19695.0

Transmit (receive) (MHz)	Receive (transmit) (MHz)
<b>340 MHz Separation</b>	
18585.0 .....	18925.0
18595.0 .....	18935.0
18605.0 .....	18945.0
18615.0 .....	18955.0
18625.0 .....	18965.0
18635.0 .....	18975.0
18645.0 .....	18985.0
18655.0 .....	18995.0
18665.0 .....	19005.0
18675.0 .....	19015.0
18685.0 .....	19025.0
18695.0 .....	19035.0
18705.0 .....	19045.0
18715.0 .....	19055.0
18725.0 .....	19065.0
18735.0 .....	19075.0
18745.0 .....	19085.0
18755.0 .....	19095.0
18765.0 .....	19105.0
18775.0 .....	19115.0
18785.0 .....	19125.0
18795.0 .....	19135.0
18805.0 .....	19145.0
18815.0 .....	19155.0

(5) 20 MHz maximum authorized bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
<b>1560 MHz Separation</b>	
17710.0 .....	19270.0
17730.0 .....	19290.0
17750.0 .....	19310.0
17770.0 .....	19330.0
17790.0 .....	19350.0
17810.0 .....	19370.0
17830.0 .....	19390.0
17850.0 .....	19410.0
17870.0 .....	19430.0
17890.0 .....	19450.0
17910.0 .....	19470.0

Transmit (receive) (MHz)	Receive (transmit) (MHz)
17930.0 .....	19490.0
17950.0 .....	19510.0
17970.0 .....	19530.0
17990.0 .....	19550.0
18010.0 .....	19570.0
18030.0 .....	19590.0
18050.0 .....	19610.0
18070.0 .....	19630.0
18090.0 .....	19650.0
18110.0 .....	19670.0
18130.0 .....	19690.0
18590.0 .....	18930.0

Transmit (receive) (MHz)	Receive (transmit) (MHz)
<b>340 MHz Separation</b>	
18610.0 .....	18950.0
18630.0 .....	18970.0
18650.0 .....	18990.0
18670.0 .....	19010.0
18690.0 .....	19030.0
18710.0 .....	19050.0
18730.0 .....	19070.0
18750.0 .....	19090.0
18770.0 .....	19110.0
18790.0 .....	19130.0
18810.0 .....	19150.0

(6) 40 MHz maximum authorized bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
<b>1560 MHz Separation</b>	
17720.0 .....	19280.0
17760.0 .....	19320.0
17800.0 .....	19360.0
17840.0 .....	19400.0
17880.0 .....	19440.0
17920.0 .....	19480.0
17960.0 .....	19520.0
18000.0 .....	19560.0
18040.0 .....	19600.0
18080.0 .....	19640.0
18120.0 .....	19680.0

(7) 80 MHz maximum authorized bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
<b>1560 MHz Separation</b>	
17740.0 .....	19300.0
17820.0 .....	19380.0
17900.0 .....	19460.0
17980.0 .....	19540.0
18060.0 .....	19620.0

(8) 220 MHz maximum authorized bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
17810.0 .....	18470.0
18030.0 .....	19370.0
18250.0 .....	19590.0

(9) The following frequencies are available for point-to-multipoint DEMS Systems:

Channel No.	Nodal station frequency band (MHz) limits	User station frequency band (MHz) limits
25	18,820-18,830	19,160-19,170
26	18,830-18,840	19,170-19,180
27	18,840-18,850	19,180-19,190
28	18,850-18,860	19,190-19,200
29	18,860-18,870	19,200-19,210
30	18,870-18,880	19,210-19,220
31	18,880-18,890	19,220-19,230
32	18,890-18,900	19,230-19,240
33	18,900-18,910	19,240-19,250
34	18,910-18,920	19,250-19,260

(i) Each station will be limited to one frequency pair per SMSA. Additional channel pairs may be assigned upon a showing that the service to be provided will fully utilize the spectrum requested. A channel pair may be subdivided as desired by the licensee.

(ii) A frequency pair may be assigned to more than one licensee in the same SMSA or service area so long as the interference protection criteria of § 101.105 are met.

(10) Special provision for low power systems in the 17-700-19700 MHz band. Notwithstanding other provisions in this Rule part, licensees of point-to-multipoint channel pairs 25-29 may operate multiple low power transmitting devices within a defined service area. The service area will be a 28 kilometer omnidirectional radius originating from specified center reference coordinates. The specified center coordinates must be no closer than 56 kilometers from any co-channel nodal station or the specified center coordinates of another co-channel system. Applicants/licensees do not need to specify the location of each individual transmitting device operating within their defined service areas. Such operations are subject to the following requirements on the low power transmitting devices:

(i) Power must not exceed one watt EIRP and 100 milliwatts transmitter output power.

(ii) A frequency tolerance of 0.001% must be maintained; and

(iii) The mean power of emissions shall be attenuated in accordance with the following schedule:

(A) In any 4 kHz band, the center frequency of which is removed from the center frequency of the assigned channel by more than 50 percent of the channel bandwidth and is within the bands 18,820-18870 MHz or 19,19160-19,210 MHz:

$$A=35+.003(F-0.5B) \text{ dB}$$

or, 80 dB (whichever is the lesser attenuation).

Where

A=Attenuation (in decibels) below output power level contained within the channel for a given polarization.

B=Bandwidth of channel in kHz.

F=Absolute value of the difference between the center frequency of the 4 kHz band measured at the center frequency of the channel in kHz.

(B) In any 4 kHz band the center frequency of which is outside the bands 18.820-18.870 GHz: At least  $43+10\log_{10}(\text{mean output power in watts})$  decibels.

(s) Special provisions for low power, limited coverage systems in the band segments 21.8-22.0 GHz and 23.0-23.2 GHz. Notwithstanding any contrary provisions in this part the frequency pairs 21.825/23.025 GHz, 21.875/23.075 GHz, 21.925/23.125 GHz and 21.975/23.175 GHz may be authorized for low power, limited coverage systems subject to the following provisions:

(1) Maximum effective radiated power (ERP) shall be 55 dBm;

(2) The rated transmitter output power shall not exceed 0.100 watts;

(3) Frequency tolerance shall be maintained to within 0.05 percent of the assigned frequency;

(4) Maximum beamwidth not to exceed 4 degrees. However, the sidelobe suppression criteria contained in § 101.115 shall not apply, except that a minimum front-to-back ratio of 38 dB shall apply;

(5) Upon showing of need, a maximum bandwidth of 50 MHz may be authorized per frequency assigned;

(6) Radio systems authorized under the provisions of this section shall have no more than five hops in tandem, except upon showing of need, but in any event the maximum tandem length shall not exceed 40 km (25 miles);

(7) Interfering signals at the antenna terminals of stations authorized under this section shall not exceed -90 dBm and -70 dBm respectively, for co-channel and adjacent channel interfering signals; and

(8) Stations authorized under the provisions of this section shall provide the protection from interference specified in § 101.105 to stations operating in accordance with the provisions of this part.

(t) 31.0 to 31.3 GHz. These frequencies are shared on a co-equal basis with other stations in the fixed and mobile services (see parts 74 of this chapter, 95 of this chapter, and this part 101). No interference protection is afforded to fixed or mobile stations operating in this band.

(1) 25 MHz authorized bandwidth channels, 150 MHz separation:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
31,012.5	31,162.5
31,037.5	31,187.5
31,062.5	31,212.5
31,087.5	31,237.5
31,112.5	31,262.5
31,137.5	31,287.5

(2) 50 MHz authorized bandwidth channels, 150 MHz separation:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
31,025.0	31,175.0
31,075.0	31,225.0
31,125.0	31,275.0

(u) Assignments in the band 38,600-40,000 MHz must be according to the following frequency plan:

Channel group A		Channel group B	
Channel No.	Frequency band limits MHz	Channel No.	Frequency Band limits MHz
1-A	38,600-38,650	1-B	39,300-39,350
2-A	38,650-38,700	1-B	39,350-39,400
3-A	38,700-38,750	3-B	39,400-39,450
4-A	38,750-38,800	4-B	39,450-39,500
5-A	38,800-38,850	5-B	39,500-39,550
6-A	38,850-38,900	6-B	39,550-39,600
7-A	38,900-38,950	7-B	39,600-39,650
8-A	38,950-39,000	8-B	39,650-39,700

Channel group A		Channel group B	
Channel No.	Frequency band limits MHz	Channel No.	Frequency Band limits MHz
9-A .....	39,000-39,050	9-B .....	39,700-39,750
10-A .....	39,050-39,100	10-B .....	39,750-39,800
11-A .....	39,100-39,150	11-B .....	39,800-39,850
12-A .....	39,150-39,200	12-B .....	39,850-39,900
13-A .....	39,200-39,250	13-B .....	39,900-39,950
14-A .....	39,250-39,300	14-B .....	39,950-40,000

Note to (u): These channels are assigned for use within a rectangular service area to be described in the application by the maximum and minimum latitudes and longitudes. Such service area must be as small as practical consistent with the local service requirements of the carrier. These frequency plans may be subdivided as desired by the licensee and used within the service area as desired without further authorization subject to the terms and conditions set forth in § 101.149. These frequencies may be assigned only where it is shown that the applicant will have reasonable projected requirements for a multiplicity of service points or transmission paths within the area.

(v) Fixed systems licensed, in operation, or applied for in the 3,700-4,200, 5925-6425, 6,525-6,875, 10,550-10,680, and 10,700-11,700 MHz bands prior to July 15, 1993, are permitted to use channel plans in effect prior to that date, including adding channels under those plans.

(w) Operations on other than the listed frequencies may be authorized where it is shown that the objectives or requirements of the interference criteria prescribed in § 101.105 could not otherwise be met to resolve the interference problems.

(x) The frequency 27.255 MHz in the 27.23-27.28 MHz band is allocated for assignment to microwave auxiliary stations in this service on a shared basis with other radio services. Assignments to stations on this frequency will not be protected from such interference as may be experienced from the emissions of industrial, scientific and medical equipment operating on 27.12 MHz in accordance with § 2.106 of this chapter.

**§ 101.149 Special requirements for operation in the band 38,600-40,000 MHz**

Assigned frequency channels in the band 38,600-40,000 MHz may be subdivided and used anywhere in the authorized service area, subject to the following terms and conditions:

- (a) No interference may be caused to a previously existing station operating in another authorized service area;
- (b) Each operating station must have posted a copy of the service area authorization; and

(c) The antenna structure height employed at any location may not exceed the criteria set forth in § 17.7 of this chapter unless, in each instance, authorization for use of a specific maximum antenna structure for each location has been obtained from the FAA prior to the erection of the antenna.

**Subpart D—Operational Requirements**

**§ 101.201 Station inspection.**

The licensee of each station authorized in the radio services included in this part must make the station available for inspection by representatives of the Commission at any reasonable hour.

**§ 101.203 Communications concerning safety of life and property.**

(a) Handling and transmission of messages concerning the safety of life or property which is in imminent danger must be afforded priority over other messages.

(b) No person may knowingly cause to be transmitted any false or fraudulent message concerning the safety of life or property, or refuse upon demand immediately to relinquish the use of a radio circuit to enable the transmission of messages concerning the safety of life or property which is in imminent danger, or knowingly interfere or otherwise obstruct the transmission of such messages.

**§ 101.205 Operation during emergency.**

The licensee of any station in these services may, during a period of emergency in which normal communication facilities are disrupted as a result of hurricane, flood, earthquake, or similar disaster, utilize such station for emergency communication service in a manner other than that specified in the instrument of authorization: Provided:

- (a) That as soon as possible after the beginning of such emergency use, notice be sent to the Commission at Washington, DC stating the nature of the emergency and the use to which the station is being put;

(b) That the emergency use of the station must be discontinued as soon as substantially normal communication facilities are again available;

(c) That the Commission at Washington, DC must be notified immediately when such special use of the station is terminated;

(d) That, in no event, will any station engage in emergency transmission on frequencies other than, or with power in excess of, that specified in the instrument of authorization or as otherwise expressly provided by the Commission, or by law; and

(e) That the Commission may, at any time, order the discontinuance of any such emergency communication.

**§ 101.207 Suspension of transmission.**

Transmission must be suspended immediately upon detection by the station or operator licensee or upon notification by the Commission of a deviation from the technical requirements of the station authorization and must remain suspended until such deviation is corrected, except for transmission concerning the immediate safety of life or property, in which case transmission must be suspended immediately after the emergency is terminated.

**§ 101.209 Operation of stations at temporary fixed locations for communication between the United States and Canada or Mexico.**

Stations authorized to operate at temporary fixed locations may not be used for transmissions between the United States and Canada, or the United States and Mexico, without prior specific notification to, and authorization from, the Commission. Notification of such intended usage of the facilities should include a detailed showing of the operation proposed, including the parties involved, the nature of the communications to be handled, the terms and conditions of such operations, the time and place of operation, such other matters as the applicant deems relevant, and a showing as to how the public interest, convenience and necessity would be

served by the proposed operation. Such notification should be given sufficiently in advance of the proposed date of operation to permit any appropriate correlation with the respective foreign government involved (see §§ 101.31, 101.811, 101.813, and 101.815).

**§ 101.211 Operator requirements.**

(a) Any person, with the consent or authorization of the licensee, may employ stations in this service for the purpose of telecommunications in accordance with the conditions and limitations set forth in § 101.135.

(b) The station licensee is responsible for the proper operation of the station at all times and is expected to provide for observations, servicing and maintenance as often as may be necessary to ensure proper operation.

(c) The provisions of paragraph (a) of this section may not be construed to change or diminish in any respect the responsibility of station licensees to have and to maintain control over the stations licensed to them (including all transmitter units thereof), or for the proper functioning and operation of those stations (including all transmitter units thereof) in accordance with the terms of the licenses of those stations.

**§ 101.213 Station identification.**

Stations in these services are exempt from the requirement to identify transmissions by call sign or any other station identifier.

**§ 101.215 Posting of station authorization and transmitter identification cards, plates, or signs.**

(a) Each licensee shall post at the station the name, address and telephone number of the custodian of the station license or other authorization if such license or authorization is not maintained at the station.

(b) The requirements in paragraph (a) of this section do not apply to remote stations using frequencies listed in § 101.147(b).

**§ 101.217 Station records.**

Each licensee of a station subject to this part shall maintain records in accordance with the following:

(a) For all stations, the results and dates of transmitter measurements and the name of the person or persons making the measurements;

(b) For all stations, when service or maintenance duties are performed, which may affect their proper operation, the responsible operator shall sign and date an entry in the station record concerned, giving:

(1) Pertinent details of all transmitter adjustments performed by him or under his supervision; and

(2) His name and address, provided that this information, so long as it remains unchanged, is not required to be repeated in the case of a person who is regularly employed as operator on a full-time basis at the station.

(c) The records shall be kept in an orderly manner, and in such detail that the data required are readily available. Key letters or abbreviations may be used if proper meaning or explanation is set forth in the record.

(d) Each entry in the records of each station shall be signed by a person qualified to do so, having actual knowledge of the facts to be recorded.

(e) No record or portion thereof shall be erased, obliterated, or willfully destroyed within the required retention period. 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.

(f) Records required by this part shall be retained by the licensee for a period of at least one year.

**Subpart E—Miscellaneous Common Carrier Provisions**

**§ 101.301 National defense; free service.**

Any common carrier authorized under the rules of this part 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 must make and file, in duplicate, with the Commission, on or before the 31st of July and on or before the 31st day of January in each year, reports covering the periods of 6 months ending on the 30th of June and the 31st of December, respectively, next prior to said dates. These reports must 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 such communications had been collected at the published tariff rates.

**§ 101.303 Answers to notices of violation.**

Any person receiving official notice of a violation of the terms of the Communications Act of 1934, as amended, any other Federal statute or Executive Order pertaining to radio or wire communications or any international radio or wire communications treaty or convention, or regulations annexed thereto to which the United States is a party, or the rules

and regulations of the Federal Communications Commission, must, within 10 days from such receipt, send a written answer to the office of the Commission originating the official notice. If an answer cannot be sent or an acknowledgment made within such 10-day period by reason of illness or other unavoidable circumstances, acknowledgment and answer must be made at the earliest practicable date with a satisfactory explanation of the delay. The answer to each notice must be complete in itself and may not be abbreviated by reference to other communications or answers to other notices. If the notice relates to some violation that may be due to the physical or electrical characteristics of transmitting apparatus, the answer must state fully what steps have been taken to prevent future violations, and, if any new apparatus is to be installed, the date such apparatus was ordered, the name of the manufacturer, and promised date of delivery. If the installation of such apparatus requires a construction permit, the file number of the application must be given or, if a file number has not been assigned by the Commission, such identification as will permit ready reference thereto. If the notice of violation relates to inadequate maintenance resulting in improper operation of the transmitter, the name and license number of the operator performing the maintenance must be given. If the notice of violation relates to some lack of attention to, or improper operation of, the transmitter by other employees, the reply must enumerate the steps taken to prevent a recurrence of such lack of attention or improper operation.

**§ 101.305 Discontinuance, reduction or impairment of service.**

(a) If the public communication service provided by a station in the Common Carrier Radio Services is involuntarily discontinued, reduced or impaired for a period exceeding 48 hours, the station licensee must promptly notify the Commission, in writing, at Federal Communications Commission, Common Carrier Radio Services, 1270 Fairfield Road, Gettysburg, Pennsylvania 17325. In every such case, the licensee must furnish full particulars as to the reasons for such discontinuance, reduction or impairment of service, including a statement as to when normal service is expected to be resumed. When normal service is resumed, prompt notification thereof must be given in writing to the Federal Communications Commission, Common Carrier Radio Services, 1270

Fairfield Road, Gettysburg, Pennsylvania 17325.

(b) No station licensee subject to title II of the Communications Act of 1934, as amended, may voluntarily discontinue, reduce or impair public communication service to a community or part of a community without obtaining prior authorization from the Commission pursuant to the procedures set forth in part 63 of this chapter. In the event that permanent discontinuance of service is authorized by the Commission, the station licensee must promptly send the station license to the Federal Communications Commission, Common Carrier Radio Services, 1270 Fairfield Road, Gettysburg, Pennsylvania 17325 for cancellation.

(c) Any common carrier station licensee, not subject to title II of the Communications Act of 1934, as amended, who voluntarily discontinues, reduces or impairs public communication service to a community or a part of a community must give written notification to the Commission within 7 days thereof. In the event of permanent discontinuance of service, the station licensee must promptly send the station license to the Federal Communications Commission, Common Carrier Radio Services, 1270 Fairfield Road, Gettysburg, Pennsylvania 17325 for cancellation.

(d) If any common carrier radio frequency should not be used to render any service as authorized during a consecutive period of twelve months at any time after construction is completed under circumstances that do not fall within the provisions of paragraph (a), (b), or (c) of this section, or, if removal of equipment or facilities has rendered the station not operational, the licensee must, within thirty days of the end of such period of nonuse:

(1) Submit for cancellation the station license (or licenses) to the Federal Communications Commission, Common Carrier Radio Services, 1270 Fairfield Road, Gettysburg, Pennsylvania 17325 for cancellation;

(2) File an application for modification of the license (or licenses) to delete the unused frequency (or frequencies); or

(3) Request waiver of this rule and demonstrate either that the frequency will be used (as evidenced by appropriate requests for service, etc.) within six months of the end of the initial period of nonuse, or that the frequency will be converted to allow rendition of other authorized public services within one year of the end of the initial period of nonuse by the filing of appropriate applications within six

months of the end of the period of nonuse.

**§ 101.307 Tariffs, reports, and other material required to be submitted to the Commission.**

Sections 1.771 through 1.815 of this chapter contain summaries of certain materials and reports, including schedule of charges and accounting and financial reports, which, when applicable, must be filed with the Commission.

**§ 101.309 Requirement that licensees respond to official communications.**

All licensees in these services are required to respond to official communications from the Commission with reasonable dispatch and according to the tenor of such communications. Failure to do so will be given appropriate consideration in connection with any subsequent applications which the offending party may file and may result in the designation of such applications for hearing, or in appropriate cases, the institution of proceedings looking to the modification or revocation of the pertinent authorizations.

**§ 101.311 Equal employment opportunities.**

Equal opportunities in employment must be afforded by all common carrier licensees in accordance with the provisions of § 21.307 of this chapter.

**Subpart F—Developmental Authorizations**

**§ 101.401 Eligibility.**

Developmental authorizations for stations in the radio services included in this part will be issued only to existing and proposed licensees who are legally, financially and otherwise qualified to conduct experimentation for the development of engineering or operational data, or techniques, directly related to a proposed radio service or to a regularly established radio service regulated by the rules of this part.

**§ 101.403 Scope of service.**

Developmental authorizations may be issued for:

(a) Field strength surveys relative to or precedent to the filing of applications for licenses, in connection with the selection of suitable locations for stations proposed to be established in any of the regularly established radio services regulated by the rules of this part; or

(b) The testing of existing or authorized antennas, wave guides, paths, or other equipment used in a system subject to this part.

**§ 101.405 Adherence to program of research and development.**

The program of research and development, as stated by an applicant in the application for license or stated in the instrument of station authorization, must be substantially adhered to unless the licensee is otherwise authorized by the Commission.

**§ 101.407 Special procedure for the development of a new service or for the use of frequencies not in accordance with the provisions of the rules in this part.**

(a) An authorization for the development of a new service not in accordance with the provisions of the rules in this part may be granted for a limited time, but only after the Commission has made a preliminary determination with respect to the factors set forth in this paragraph, as each case may require. This procedure also applies to any application that involves use of a frequency which is not in accordance with the provisions of the rules in this part, although in accordance with the Table of Frequency Allocations contained in part 2 of this chapter. (An application which involves use of a frequency which is not in accordance with the Table of Frequency Allocations in part 2 of this chapter should be filed in accordance with the provisions of part 5 of this chapter, Experimental Radio Services.) The factors with respect to which the Commission will make a preliminary determination before acting on an application filed under this paragraph are as follows:

(1) That the public interest, convenience or necessity warrants consideration of the establishment of the proposed service or the use of the proposed frequency;

(2) That the proposed operation appears to warrant consideration to effect a change in the provisions of the rules in this part; and/or

(3) That some operational data should be developed for consideration in any rule making proceeding which may be initiated.

(b) Applications for stations that are intended to be used in the development of a proposed service must be accompanied by a petition to amend the Commission's rules with respect to frequencies and such other items as may be necessary to provide for the regular establishment of the proposed service.

**§ 101.409 Terms of grant; general limitations.**

(a) Developmental authorizations normally will be issued for one year, or such shorter term as the Commission

may deem appropriate in any particular case, and will be subject to cancellation without hearing by the Commission at any time upon notice to the licensee.

(b) Where some phases of the developmental program are not covered by the general rules of the Commission or by the rules of this part, the Commission may specify supplemental or additional requirements or conditions in each case as it may deem necessary in the public interest, convenience or necessity.

(c) Frequencies allocated to the service toward which such development is directed will be assigned for developmental operation on the basis that no interference will be caused to the regular services of stations operating in accordance with the Commission's Table of Frequency Allocations (§ 2.106 of this chapter).

(d) The rendition of communication service for hire is not permitted under any developmental authorizations unless specifically authorized by the Commission.

(e) The grant of a developmental authorization carries with it no assurance that the developmental program, if successful, will be authorized on a permanent basis either as to the service involved or the use of the frequencies assigned or any other frequencies.

**§ 101.411 Supplementary showing required.**

(a) Authorizations for development of a proposed radio service in the services included in this part will be issued only upon a showing that the applicant has a definite program of research and development, the details of which must be set forth, which has reasonable promise of substantial contribution to these services within the term of such authorization. A specific showing should be made as to the factors which qualify the applicant technically to conduct the research and development program, including a description of the nature and extent of engineering facilities that the applicant has available for such purposes.

(b) Expiring developmental authorizations may be renewed only upon the applicant's compliance with the applicable requirements of § 101.413 (a) and (b) relative to the authorization sought to be renewed and upon a factual showing that further progress in the program of research and development requires further radio transmission and that the public interest, convenience or necessity would be served by renewal of such authorization.

**§ 101.413 Developmental report required.**

(a) Upon completion of the program of research and development, or, in any event, upon the expiration of the instrument of station authorization under which such investigations were permitted, or at such times during the term of the station authorization as the Commission may deem necessary to evaluate the progress of the developmental program, the licensee must submit, in duplicate, a comprehensive report on the following items, in the order designated:

- (1) Report on the various phases of the project which were investigated;
- (2) Total number of hours of operation on each frequency assigned;
- (3) Copies of any publication on the project;
- (4) Detailed analysis of the result obtained; and
- (5) Any other pertinent information.

(b) In addition to the information required by paragraph (a) of this section, the developmental report of a station authorized for the development of a proposed radio service must include comprehensive information on the following items:

- (1) Probable public support and methods of its determination;
- (2) Practicability of service operations;
- (3) Interference encountered;
- (4) Pertinent information relative to merits of the proposed service;
- (5) Propagation characteristics of frequencies used, particularly with respect to the service objective;
- (6) Frequencies believed to be more suitable and reasons therefor; and
- (7) Type of signals or communications employed in the experimental work.

(c) Developmental reports will be made a part of the Commission's public records, except upon the applicant's specific request for confidentiality and Commission approval in accordance with § 0.459 of this chapter. Information determined confidential by the Commission will not be publicly disclosed.

**Subpart G—Digital Electronic Message Service**

**§ 101.501 Eligibility.**

Applications will be granted only in cases in which the applicant establishes it is legally, technically, financially and otherwise qualified to render the services proposed and that the public interest, convenience and necessity would be served by such a grant. Each application will identify the Standard Metropolitan Statistical Area (SMSA) within which boundaries the Digital Electronic Message Service (DEMS) nodal station will be constructed and which the facility will serve.

**§ 101.503 Digital Electronic Message Service Nodal Stations.**

DEMS Nodal Stations may be authorized only as a part of an integrated communication system wherein DEMS User Stations associated therewith also are licensed to the DEMS Nodal Station licensee. Applications for DEMS Nodal Station licenses should specify the maximum number of DEMS User Stations to be served by that nodal station. Any increase in that number must be applied for pursuant to § 101.15.

**§ 101.505 Frequencies.**

(a) Frequencies in the 17,700–19,700 MHz band are available for assignment for all DEMS applicants. Assignment will consist of a pair of channels as set out in paragraph (c) of this section plus internodal channels as set out in paragraph (d) of this section.

(b) Licensees may apply for an additional channel pair in an SMSA only when it is operating its previously authorized DEMS at or near the expected capacity and the service to be provided will fully utilize all spectrum requested.

(c) DEMS assignments will be made according to the following plan, except that systems licensed, in operation, or applied for in the 10,565–10,615 and 10,630–10,680 MHz bands prior to July 15, 1993 are permitted to use frequencies in those bands if they prior coordinate with 10 GHz point-to-point licensees:

Channel No	Nodal station frequency band (MHz)	User station frequency band (MHz)
30 .....	18,870–18,880	19,210–19,220
31 .....	18,880–18,890	19,220–19,230
32 .....	18,890–18,900	19,230–19,240
33 .....	18,900–18,910	19,240–19,250
34 .....	18,910–18,920	19,250–19,260

Note to (c): These channel pairs will be assigned in each SMSA and may be subdivided as desired by the licensee.

(d) Internodal link assignments are to be made in accordance with the provisions of Subpart I of this part, applying to point-to-point operations.

**§ 101.507 Frequency stability.**

The frequency stability of each DEMS Nodal Station transmitter authorized for this service in the 17,700–19,700 MHz band must be ±0.001%. The frequency stability of each DEMS User Station transmitter authorized for this service in this band must be ±0.003%.

**§ 101.509 Interference protection criteria.**

(a) All harmful interference to other users and blocking of adjacent channel

use in the same city and cochannel use in nearby Standard Metropolitan Statistical Areas is prohibited. In areas where SMSA's are in close proximity, careful consideration should be given to minimum power requirements and to the location, height, and radiation pattern of the transmitting antenna. Licensees and applicants are expected to cooperate fully in attempting to resolve problems of potential interference before bringing the matter to the attention of the Commission.

(b) As a condition for use of frequencies in this service each carrier is required to:

(1) Engineer the system to be reasonably compatible with adjacent channel operations in the same city; and  
(2) Cooperate fully and in good faith to resolve whatever potential interference and transmission security problems may be present in adjacent channel operation.

(c) The following interference studies, as appropriate, must be included with each application for a new or major modification in a DEMS Nodal Station:

(1) An analysis of the potential for harmful interference with other stations if the coordinates of any proposed station are located within 80 kilometers (50 miles) of the coordinates of any authorized, or previously proposed station(s) that utilizes, or would utilize, the same frequency or an adjacent potentially interfering frequency; and  
(2) An analysis concerning possible adverse impact upon Canadian communications if the station's transmitting antenna is to be located within 55 kilometers (35 miles) of the Canadian border.

(d) In addition a copy of the interference analysis submitted in response to paragraph (c)(1) of this section must be served on all applicants and/or grantees concerned within 5 days of its submission to the Commission.

**§ 101.511 Purpose and permissible service.**

(a) The DEMS is intended to provide for the exchange of digital information among and between subscribers using one or more DEMS Systems.

(b) Unless otherwise directed or conditioned in the applicable instrument of authorization, DEMS may be used to exchange any type of digital information consistent with the Commission's Rules and the applicable tariff of the carrier.

(c) The carrier's tariff must fully describe the parameters of the service to be provided, including the degree of communications security a subscriber can expect in ordinary service.

**§ 101.513 Transmitter power.**

The transmitter power will be governed by § 101.113. Further, each application must contain an analysis demonstrating compliance with § 101.113(a).

**§ 101.515 Emissions and bandwidth.**

Different types of emissions may be authorized if the applicant describes fully the modulation and bandwidth desired, and demonstrates that the bandwidth desired is no wider than needed to provide the intended service. In no event, however, may the necessary or occupied bandwidth exceed the specified channel width of the assigned pair.

**§ 101.517 Antennas.**

(a) Transmitting antennas may be omnidirectional or directional, consistent with coverage and interference requirements.

(b) The use of horizontal or vertical plane wave polarization, or right hand or left hand rotating elliptical polarization must be used to minimize harmful interference between stations.

(c) Directive antennas must be used at all DEMS User Stations and may be elevated no higher than necessary to assure adequate service. Antenna structures requiring FAA notification under part 17 of this chapter must be registered with the Commission. The structure owner is responsible for registering, painting, and lighting the structure if applicable. Requests for such authorization must show the inclusive dates of the proposed operation.

**§ 101.519 Interconnection.**

(a) All DEMS licensees must make available to the public all information necessary to allow the manufacture of user equipment that will be compatible with the licensee's network.

(b) All DEMS licensees must make available to the public all information necessary to allow interconnection of DEMS networks.

**§ 101.521 Spectrum utilization.**

All applicants for DEMS frequencies must submit as part of the original application a detailed plan indicating how the bandwidth requested will be utilized. In particular the application must contain detailed descriptions of the modulation method, the channel time sharing method, any error detecting and/or correcting codes, any spatial frequency reuse system and the total data throughput capacity in each of the links in the system. Further, the application must include a separate analysis of the spectral efficiency

including both information bits per unit bandwidth and the total bits per unit bandwidth.

**Subpart H—Private Operational Fixed Point-to-Point Microwave Service**

**§ 101.601 Eligibility**

Any person, or any governmental entity or agency, eligible for licensing in a radio service under parts 80, 87, or 90 of this chapter or any person proposing to provide communications service to such persons, governmental entities or agencies is eligible to hold a license under this subpart.

**§ 101.603 Permissible communications.**

(a) Except as provided in paragraph (b) of this section, stations in this radio service may transmit communications as follows:

(1) On frequencies below 21,200 MHz, licensees may transmit their own communications, including the transmission of their products and information services, to their customers except that the distribution of video entertainment material to customers is permitted only as indicated in § 101.101 and paragraph (a)(2) of this section.

(2) In the frequency bands 6425–6525 MHz, 18,142–18,580 MHz and on frequencies above 21,200 MHz, licensees may deliver any of their own products and services to any receiving location;

(3) Licensees may transmit the communications of their parent corporation, or of another subsidiary of the same parent, or their own subsidiary where the party to be served is regularly engaged in any of the activities that constitute the basis for eligibility to use the frequencies assigned;

(4) Licensees may transmit the communications of other parties in accordance with § 101.135;

(5) Licensees may transmit emergency communications unrelated to their activities in accordance with § 101.205;

(6) Licensees may transmit communications on a commercial basis to eligible users, among different premises of a single eligible user, or from one eligible user to another as part of transmissions by Digital Electronic Message Service systems on the frequencies provided for this purpose;

(7) Licensees may transmit program material from one location to another, provided that the frequencies do not serve as the final RF link in the chain of distribution of the program material to broadcast stations;

(b) Stations licensed in this radio service shall not:

(1) Render a common carrier communications service of any kind;

(2) Transmit program material for use in connection with broadcasting, except as provided in paragraphs (a)(2), and (a)(7) of this section; and/or

(3) Be used to provide the final RF link in the chain of transmission of program material to cable television systems, multipoint distribution systems or master antenna TV systems, except in the frequency bands 6425–6525 and 18,142–18,580 MHz and on frequencies above 21,200 MHz.

### Subpart I—Common Carrier Fixed Point-to-Point Microwave Service

#### § 101.701 Eligibility.

(a) Authorizations for stations in this service will be issued to existing and proposed common carriers.

Applications will be granted only in cases in which it is shown that:

(1) The applicant is legally, technically, financially and otherwise qualified to render the proposed service;

(2) There are frequencies available to enable the applicant to render a satisfactory service; and

(3) The public interest, convenience, and necessity would be served by a grant thereof.

(b) If the content is originated, selected, controlled, or otherwise substantively influenced by the applicant, licensee, or a closely affiliated entity, no station or radio frequency in this service will be authorized, or may be utilized, to transmit any closed circuit television signals or television signals other than broadcast television signals, unless:

(1) Such service is otherwise permitted for a specific length of time by grant of an acceptable petition for waiver of this rule; or

(2) Such service is otherwise permitted by a condition in the applicable instrument of authorization; or

(3) Such service is provided pursuant to applicable FCC tariff and is temporary and occasional intra-company television communication for management, network supervision, or other internal carrier functions. For purposes of this paragraph, an entity will be considered to be "closely affiliated" with an applicant if it is in a parent-subsidiary relationship, or both are commonly controlled, or they have any common officers or management employees.

(c) Applications for stations or frequencies that will be used primarily to relay broadcast television signals must include a demonstration (including appropriate system diagrams and tables) that at least fifty percent of the customers (or points of service) on

the microwave system involved, including those served through an interconnecting carrier(s), receiving applicant's service, will not be related or affiliated in any degree with the applicant, and that the proposed usage by such customers, in terms of hours of use and channels delivered, must constitute at least fifty percent of the usage of the applicant's microwave service.

Applications that do not contain these demonstrations will be returned as unacceptable for filing.

#### § 101.703 Permissible communications.

Stations in this service are authorized to render any kind of communication service provided for in the legally applicable tariffs of the carrier, unless otherwise directed in the applicable instrument of authorization or limited by § 101.147 or §§ 101.111 and 101.113.

#### § 101.705 Renewal of station licenses.

(a) An application for renewal of a station license in the Common Carrier Fixed Point-to-Point Microwave Service primarily used to relay television signals must contain:

(1) A statement that such use complies with § 101.701(b); and

(2) The demonstration required by § 101.701(c). Applications that do not contain these items as appropriate will be returned as unacceptable for filing.

(b) Any application for renewal of license, for a term commencing January 1, 1975, or after, involving facilities utilizing frequency diversity must contain a statement showing compliance with § 101.103(c) or the exceptions recognized in paragraph 141 of the "First Report and Order" in Docket No. 18920 (29 FCC 2d 870). (This document is available at: Federal Communications Commission, Library (Room 639), 1919 M Street, NW., Washington, DC.) If not in compliance, a complete statement with the reasons therefor must be submitted.

### Subpart J—Local Television Transmission Service

#### § 101.801 Eligibility.

Authorizations for stations in this service will be granted to existing and proposed communication common carriers. Applications will be granted only in cases where it is shown that:

(a) The applicant is legally, financially, technically and otherwise qualified to render the proposed service;

(b) There are frequencies available to enable the applicant to render a satisfactory service; and

(c) The public interest, convenience or necessity would be served by a grant thereof.

#### § 101.803 Frequencies.

(a) Frequencies in the following bands are available for assignment to television pickup and television non-broadcast pickup stations in this service:

6,425 to 6,525 MHz. (6)

11,700 to 12,200 MHz. (3)

13,200 to 13,250 MHz. (1)

14,200 to 14,400 MHz.

21,200 to 22,000 MHz. (1), (2), (4), (5)

22,000 to 23,600 MHz. (1), (2), (5)

31,000 to 31,300 MHz. (7)

#### Notes

(1) This frequency band is shared with fixed and mobile stations licensed under this and other parts of the Commission's Rules.

(2) This frequency band is shared with Government stations.

(3) This frequency band is shared, on a secondary basis, with stations in the broadcasting-satellite and fixed-satellite services.

(4) This frequency band is shared with stations in the earth-exploration satellite service.

(5) Assignments to common carriers in this band are normally made in the segments 21,200–21,800 MHz and 22,400–23,800 MHz and to operational fixed users in the segments 21,800–22,400 MHz and 23,000–23,600 MHz. Assignments may be made otherwise only upon a showing that interference free frequencies are not available in the normally assigned band segments. The maximum power for the local television transmission service in the 14.2–14.4 GHz band is +45 dBW except that operations are not permitted within 1.5 degrees of the geostationary orbit.

(6) This band is co-equally shared with mobile stations licensed pursuant to parts 74 and 78 of this chapter, and subpart H of this part.

(7) Use of this spectrum for direct delivery of video programs to the general public or multi-channel cable distribution is not permitted.

(b) Communications common carriers in the Local Television Transmission Service may be assigned frequencies listed in §§ 74.602(a), 78.18(a)(7) and 78.18(a)(8) of this chapter to provide service to television broadcast stations, television broadcast network-entities, cable system operators and cable network-entities. Frequency availability is subject to the provisions of § 74.604 of this chapter and the use of the facility is limited to the permissible uses described in §§ 74.631 and 78.11 of this chapter. Operations on these frequencies are subject to the technical provisions of part 74, subpart F, and part 78, subpart D of this chapter.

(c) [Reserved]

(d) Frequencies in the following bands are available for assignment to television STL stations in this service:

3,700 to 4,200 MHz (1)

5,925 to 6,425 MHz (1),(5)

- 10,700 to 11,700 MHz (1),(6)
- 13,200 to 13,250 MHz (2)
- 21,200 to 22,000 MHz (2),(4),(7),(8)
- 22,000 to 23,600 MHz (2),(6),(8)
- 31,000 to 31,300 MHz (9)

Notes

- (1) This frequency band is shared with stations in the Point to Point Microwave Radio Service and, in United States Possessions in the Caribbean area, with stations in the International Fixed Radiocommunications Services.
- (2) This frequency band is shared with fixed and mobile stations licensed under this and other parts of the Commission's rules.
- (3) This frequency band is shared with space stations (space to earth) in the fixed-satellite service.
- (4) This frequency band is shared with Government stations.
- (5) This frequency band is shared with earth stations (earth to space) in the fixed-satellite services.
- (6) The band segments 10.95–11.2 and 11.45–11.7 GHz are shared with space stations (space to earth) in the fixed-satellite service.
- (7) This frequency band is shared with space stations (space to earth) in the earth exploration satellite service.
- (8) Assignments to common carriers in this band are normally made in the segments 21,200–21,800 MHz and 22,400–23,000 MHz and to operational fixed users in the segments 21,800–22,400 MHz and 23,000–23,600 MHz. Assignments may be made otherwise only upon a showing that interference free frequencies are not available in the appropriate band segments.
- (9) Frequencies in this band are co-equally shared with stations in the Auxiliary Broadcasting (part 74) of this chapter, Cable Television Relay (part 78) of this chapter, Private Operational-Fixed Microwave (subpart H) of this part, and General Mobile Radio Services (part 95) of this chapter.

(e) 31.0 to 31.3 GHz. These frequencies are shared on a co-equal basis with other stations in the fixed and mobile services (see parts 74, 78, and 95 of this chapter, and subpart H of this part). No interference protection is afforded to fixed or mobile stations operating in this band.

(1) 25 MHz authorized bandwidth channels, 150 MHz separation.

Transmit (receive) (MHz)	Receive (transmit) (MHz)
31,012.5 .....	31,162.5
31,037.5 .....	31,187.5
31,062.5 .....	31,212.5
31,087.5 .....	31,237.5
31,112.5 .....	31,262.5
31,137.5 .....	31,287.5

(2) 50 MHz authorized bandwidth channels, 150 MHz separation.

Transmit (receive) (MHz)	Receive (transmit) (MHz)
31,025.0 .....	31,175.0
31,075.0 .....	31,225.0
31,125.0 .....	31,275.0

(f) On the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations, persons holding valid station authorizations on July 15, 1963, to provide television nonbroadcast pickup service in the 6525–6575 MHz band may be authorized to continue use of the frequencies specified in their authorization for such operations until July 15, 1968.

(g) 6425 to 6525 MHz—Mobile Only. Paired and un-paired operations permitted. Use of this spectrum for direct delivery of video programs to the general public or for multi-channel cable distribution is not permitted. This band is co-equally shared with mobile stations licensed pursuant to parts 74 and 78 of this chapter. The following channel plans apply.

(1) 1 MHz maximum authorized bandwidth channels.

Transmit (or receive) (MHz)	Receive (or transmit) (MHz)
6425.5 .....	6475.5
6450.5 .....	6500.5

(2) 8 MHz maximum authorized bandwidth channels.

Transmit (or receive) (MHz)	Receive (or transmit) (MHz)
6430.0 .....	6480.0
6438.0 .....	6488.0
6446.0 .....	6596.0
6455.0 .....	6505.0
6463.0 .....	6513.0
6471.0 .....	6521.0

(3) 25 MHz maximum authorized bandwidth channels.

Transmit (or receive) (MHz)	Receive (or transmit) (MHz)
6437.5 .....	6487.5
6462.5 .....	6512.5

(h) The frequency 27.255 MHz in the 27.23–27.28 MHz band is allocated for assignment to microwave auxiliary stations in this service on a shared basis with other radio services. Assignments to stations on this frequency will not be protected from such interference as may be experienced from the emissions of

industrial, scientific and medical equipment operating on 27.12 MHz in accordance with § 2.106 of this chapter.

**§ 101.805 Assignment of frequencies to mobile stations.**

The assignment of frequencies to mobile stations in this service will not be limited to a single licensee within any area. However, geographical limits within which mobile units may operate may be imposed by the Commission.

**§ 101.807 Transmitter power.**

Stations in this service will not be authorized to use transmitters having a rated power output in excess of the limits set forth in § 101.113(b) and a standby transmitter having a rated power output in excess of that of the main transmitter with which it is associated will not be authorized.

**§ 101.809 Bandwidth and emission limitations.**

(a) Stations in this service operating on frequencies in the 27.23–27.28 MHz band will be authorized to employ only amplitude modulated or frequency modulated emission for radiotelephony. The authorization to use such emissions will be construed to include authority to employ unmodulated emission only for temporary or short periods necessary for equipment testing incident to the construction and maintenance of the station.

(b) Stations in the service operating on frequencies above 940 MHz may be authorized to use amplitude modulated, frequency modulated or pulse type of emission for radiotelephony and television. In addition, the use of unmodulated emission may be authorized in appropriate cases.

(c) The maximum bandwidths which will normally be authorized for single channel operation on frequencies below 500 MHz in this service must not exceed the limits set forth below:

Type of emission	Authorized bandwidth (kHz)
A3E .....	8
F3E or (G3E) .....	40

(d) Maximum bandwidths in the following frequency bands must not exceed the limits set forth below:

Frequency band (MHz)	Maximum authorized bandwidth (MHz)
3,700 to 4,200 .....	20
5,925 to 6,425 .....	30
6,425 to 6,525 .....	25
10,700 to 12,200 .....	40
13,200 to 13,250 .....	25

Frequency band (MHz)	Maximum authorized bandwidth (MHz)
22,000 to 23,600 .....	100

(e) The bandwidths authorized on frequencies above 500 MHz must be appropriate to the type of operation in any particular case. An application requesting such authorization must fully describe the modulation, emission, and bandwidth desired and must specify the bandwidth to be occupied.

**§ 101.811 Modulation requirements.**

(a) The use of modulating frequencies higher than 3000 hertz for single channel radiotelephony or tone signaling on frequencies below 500 MHz is not authorized.

(b) When amplitude modulation is used, the modulation percentage must be sufficient to provide efficient communication and must normally be maintained above 70 percent on positive peaks, but may not exceed 100 percent on negative peaks.

(c) When phase or frequency modulation is used for single channel radiotelephony on frequencies below 500 MHz, the deviation arising from modulation may not exceed plus or minus 15 kHz from the unmodulated carrier.

(d) Each unmultiplexed radiotelephone transmitter having more than 3 watts plate power input to the final radio frequency stage and initially installed at the station in this service after September 4, 1956, must be provided with a device that will automatically prevent modulation in excess of that specified in paragraphs (b) and (c) of this section which may be caused by greater than normal audio level.

**§ 101.813 Remote control operation of mobile television pickup stations.**

(a) Mobile television pickup stations (including nonbroadcast) may be operated by remote control from the fixed locations for periods not to exceed 6 months.

(b) The Commission may, upon adequate showing by the licensee as to why the television pickup operations should not be conducted under a fixed station authorization, renew the authority granted under the provisions of paragraph (a) of this section.

(c) Reference should be made to § 101.125 concerning mobile station antenna height restrictions and to paragraphs (c) and (f) of § 101.131 concerning control points.

**§ 101.815 Stations at temporary fixed locations.**

(a) Authorizations may be issued upon proper application for the use of frequencies listed in § 101.803 by stations in the Local Television Transmission Service for rendition of temporary service to subscribers under the following conditions:

(1) When a fixed station is to remain at a single location for less than 6 months, the location is considered to be temporary. Services that are initially known to be of longer than 6 months' duration may not be provided under a temporary fixed authorization but rendered pursuant to a regular license.

(2) When a fixed station authorized to operate at temporary locations is installed and it subsequently becomes necessary for the station to operate from such location for more than six months, application FCC Form 494 for a station authorization to specify the permanent location must be filed at least thirty days prior to the expiration of the six month period.

(3) The station must be used only for rendition of communication service at a remote point where the provision of wire facilities is not practicable.

(4) The antenna structure height employed at any location may not exceed the criteria set forth in § 17.7 of this chapter unless, in each instance, authorization for use of a specific maximum antenna structure height for each location has been obtained from the Commission prior to erection of the antenna. See § 101.125.

(5) Applications for such stations must comply with the provisions of § 101.713.

(b) Applications for authorizations to operate stations at temporary locations under the provisions of this section may be made upon FCC Form 494. Blanket applications may be submitted for the required number of transmitters.

(c) Prior coordination of mobile assignments will be in accordance with the procedures in § 101.103(d) except that the prior coordination process for mobile (temporary fixed) assignments may be completed orally and the period allowed for response to a coordination notification may be less than 30 days if the parties agree.

**§ 101.817 Notification of station operation at temporary locations.**

(a) The licensee of stations authorized pursuant to § 101.813 must notify the Commission prior to each period of operation. This notification may be oral or written and must include:

(1) The call sign, manufacturer's name, type or model number, output

power and specific location of the transmitter(s);

(2) The maintenance location for the transmitter;

(3) The location of the transmitting or receiving station with which it will communicate and the identity of the correspondent operating such facilities;

(4) The exact frequency or frequencies to be used;

(5) The public interest, convenience and necessity to be served by operation of the proposed installation;

(6) The commencement and anticipated termination dates of operation from each location. In the event the actual termination date differs from the previous notification, written notice thereof promptly must be given to the Commission;

(7) Where the notification contemplates initially a service that is to be rendered for a period longer than 90 days, the notification must contain a showing as to why application should not be made for regular authorization; and

(8) A notification must include compliance with the provisions of § 101.813(c).

(b) A copy of the notification must be kept with the station license.

**§ 101.819 Stations affected by coordination contour procedures.**

In frequency bands shared with the communication-satellite service, applicants must also comply with the requirements of § 101.21.

Note: This attachment will not be published in the Code of Federal Regulations.

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