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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

[61 FR 26677, May 28, 1996, as amended at 62 FR 24583, May 6, 1997; 63 FR 36611, July 7, 1998; 65 FR 59358, Oct. 5, 2000; 67 FR 43039, June 26, 2002; 68 FR 4958, Jan. 31, 2003; 76 FR 59572, Sept. 27, 2011; 77 FR 54433, Sept. 5, 2012]

§ 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

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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 in paragraph (a) of this section, the EIRP shall not exceed the value derived from the following equation:

$$EIRP = MAXEIRP - 40 \cdot \log(A/B) \text{ dBW}$$

Where: EIRP = The new maximum EIRP (equivalent isotropically radiated power) in dBW. MAXEIRP = Maximum EIRP as set forth in the Table in Section 101.113(a).

A = Minimum path length from the Table above for the frequency band in kilometers.

B = The actual path length in kilometers.

NOTE TO PARAGRAPH (b): For transmitters using Automatic Transmitter Power Control, EIRP corresponds to the maximum transmitter power available, not the coordinated transmit power or the nominal transmit power.

(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.

[61 FR 26677, May 28, 1996, as amended at 65 FR 38330, June 20, 2000]

§ 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, 5925–7075 MHz, and 12.7–13.25 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 (b) and (c) of this section are permitted to operate indefinitely, provided that

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the operation of such stations does not result in harmful interference to reception in these bands on board geostationary space stations.

(b) *2655 to 2690 MHz and 5925 to 7075 MHz.* No directional transmitting antenna utilized by a fixed station operating in these bands with EIRP greater than 35 dBW 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 13.25 GHz.* No directional transmitting antenna utilized by a fixed station operating in this band with EIRP greater than 45 dBW may be aimed within 1.5 degrees of the geostationary-satellite orbit, taking into account atmospheric refraction.

(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).

[61 FR 26677, May 28, 1996, as amended at 65 FR 38330, June 20, 2000; 68 FR 12777, Mar. 17, 2003; 77 FR 54433, Sept. 5, 2012]

§ 101.147 Frequency assignments.

(a) Frequencies in the following bands are available for assignment for fixed microwave services.

- 928.0-929.0 MHz (28)
- 932.0-932.5 MHz (27)
- 932.5-935 MHz (17)
- 941.0-941.5 MHz (27)
- 941.5-944 MHz (17) (18)
- 952.0-960.0 MHz (28)
- 1,850-1,990 MHz (20) (22)
- 2,110-2,130 MHz (1) (3) (7) (20) (23)
- 2,130-2,150 MHz (20) (22)
- 2,160-2,180 MHz (1) (2) (20) (23)
- 2,180-2,200 MHz (20) (22)
- 2,450-2,500 MHz (12)
- 2,650-2,690 MHz
- 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) (33)
- 6,875-7,125 MHz (10), (34)
- 10,550-10,680 MHz (19)
- 10,700-11,700 MHz (8) (9) (19) (25)
- 11,700-12,200 MHz (24)
- 12,200-12,700 MHz (31)
- 12,700-13,200 (22), (34)
- 13,200-13,250 MHz (4) (24) (25)
- 14,200-14,400 MHz (24)
- 17,700-18,820 MHz (5) (10) (15)
- 17,700-18,300 MHz (10) (15)
- 18,820-18,920 MHz (22)
- 18,300-18,580 MHz (5) (10) (15)
- 18,580-19,300 MHz (22) (30)
- 18,920-19,160 MHz (5) (10) (15)
- 19,160-19,260 MHz (22)
- 19,260-19,700 MHz (5) (10) (15)
- 19,300-19,700 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)
- 24,250-25,250 MHz
- 29,100-29,250 MHz (5), (16)
- 31,000-31,300 MHz (16)
- 42,000-42,500 MHz
- 71,000-76,000 MHz (5) (17)
- 81,000-86,000 MHz (5) (17)
- 92,000-94,000 MHz (17)
- 94,100-95,000 MHz (17)

Notes

(1) Frequencies in this band are shared with control and repeater stations in the Public Mobile Services and with stations in the International Fixed Public Radio communication 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