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

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

(f) For all stations, station record entries shall be made in an orderly and legible manner by the person or persons competent to do so, having actual knowledge of the facts required, who shall sign the station record when starting duty and again when going off duty.

(g) For all stations, no station record or portion thereof shall be erased, obliterated, or willfully destroyed within the period of retention required by rule. Any necessary correction may be made only by the person who made the original entry who shall strike out the erroneous portion, initial the correction made, and show the date the correction was made.

(h) For all stations, station records shall be retained for a period of not less than 2 years. The Commission reserves the right to order retention of station

records for a longer period of time. In cases where the licensee or permittee has notice of any claim or complaint, the station record shall be retained until such claim or complaint has been fully satisfied or until the same has been barred by statute limiting the time for filing of suits upon such claims.

[41 FR 29695, July 19, 1976, as amended at 49 FR 20672, May 16, 1984; 50 FR 23422, June 4, 1985]

### § 78.75 Equal employment opportunities.

See Subpart E, Part 76 of this chapter.

[51 FR 9966, Mar. 24, 1986]

## Subpart D—Technical Regulations

### § 78.101 Power limitations.

(a) On any authorized frequency, the average power delivered to an antenna shall be the minimum amount of power necessary to carry out the communications desired. In no event shall the average transmitter power or equivalent isotropically radiated power (EIRP) exceed the values specified below.

Frequency band (MHz)	Maximum allowable transmitter power— mobile (W)	Maximum allowable EIRP <sup>1,2</sup>	
		Fixed (dBW)	Mobile (dBW)
2,025 to 2,110 .....	20.0	.....	+35
6,425 to 6,525 .....	20.0	.....	+35
6,875 to 7,125 .....	20.0	.....	+35
12,700 to 13,250 .....	1.5	+55	+45
17,700 to 18,600 .....	.....	+55	.....
18,600 to 18,800 <sup>1</sup> .....	.....	+35	.....
18,800 to 19,700 .....	.....	+55	.....

<sup>1</sup> The power delivered to the antenna is limited to –3 dBW.

<sup>2</sup> Stations licensed based on an application filed before April 16, 2003, for EIRP values exceeding those specified above, may continue to operate indefinitely in accordance with the terms of their current authorizations, subject to periodic renewal.

(b) LDS stations shall use for the visual signal-vestigial sideband AM transmission. When vestigial sideband AM transmission is used the peak power of the visual signal on all channels shall be maintained within 2 dB of equality. The mean power of the aural signal on each channel shall not exceed a level of 7 dB below the peak power of the visual signal.

(c) The EIRP of transmitters that use Automatic Transmitter Power Control (ATPC) shall not exceed the EIRP spec-

ified on the station authorization. The EIRP of non-ATPC transmitters shall be maintained as near as practicable to the EIRP specified on the station authorization.

[45 FR 78694, Nov. 26, 1980, as amended at 52 FR 7144, Mar. 9, 1987; 65 FR 48182, Aug. 7, 2000; 68 FR 12776, Mar. 17, 2003]

### § 78.103 Emissions and emission limitations.

(a) A CARS station may be authorized to employ any type of emission,

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for which there are technical standards incorporated in Subpart D of this part, suitable for the simultaneous transmission of visual and aural television signals.

(b) Any emission appearing on a frequency outside of the channel authorized for a transmitter shall be attenuated below the power of the emission in accordance with the following schedule:

(1) For stations using FM or double sideband AM transmission:

(i) On any frequency above the upper channel limit or below the lower channel limit by between zero and 50 percent of the authorized channel width: At least 25 decibels below the mean power of the emission;

(ii) On any frequency above the upper channel limit or below the lower channel limit by more than 50 percent and up to 150 percent of the authorized channel width: At least 35 decibels below the mean power of the emission; and

(iii) On any frequency above the upper channel limit or below the lower channel limit by more than 150 percent of the authorized channel width: At least  $43 + 10 \log_{10}$  (power in watts) decibels below the mean power of the emission.

(2) For CARS stations using vestigial sideband AM transmission: At least 50 decibels below the peak power of the emission.

(c) For operation in the 17.7-19.7 GHz band:

The mean power of any emission shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

(1) When using frequency modulation:

(i) On any frequency removed from the assigned (center) frequency by more than 50% up to and including 100% of the authorized bandwidth: At least 25 dB;

(ii) On any frequency removed from the assigned (center) frequency by more than 100% up to and including 250% of the authorized bandwidth: At least 35 dB;

(iii) On any frequency removed from the assigned (center) frequency by more than 250% of the authorized bandwidth: At least  $43 + 10 \log_{10}$  (mean out-

put power in watts) dB, or 80 dB, whichever is the lesser attenuation.

(2) When using digital modulation:

(i) In any 1 MHz band, the center frequency of which is removed from the assigned frequency by more than 50% up to and including 250% of the authorized bandwidth: As specified by the following equation but in no event less than 11 dB.

$$A = 11 + 0.4 (P - 50) + 10 \log_{10} B$$

where:

A=Attenuation (in dB) below the mean output power level.

P=Percent removed from the carrier frequency.

B=Authorized bandwidth in MHz.

[Attenuation greater than 56 decibels is not required.]

(ii) In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 250% of the authorized bandwidth: At least  $43 + 10 \log_{10}$  (mean output power in watts) dB, or 80 dB, whichever is the lesser attenuation.

(3) Amplitude Modulation:

For vestigial sideband AM video: On any frequency removed from the center frequency of the authorized band by more than 50%: at least 50 dB below peak power of the emission.

(d) In the event that interference to other stations is caused by emissions outside the authorized channel, the Commission may require greater attenuation than that specified in paragraph (b) of this section.

(e) The maximum bandwidth that will be authorized per frequency assignment 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 bandwidth less than the maximum would be sufficient to support an applicant's intended communications.

Frequency band (MHz)	Maximum authorized band-width (MHz)
1,990 to 2,110 .....	17 or 18. <sup>1</sup>
6,425 to 6,525 .....	8 or 25.
6,875 to 7,125 .....	25.
12,700 to 13,250 .....	25.

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Frequency band (MHz)	Maximum authorized band-width (MHz)
17,700 to 19,700 .....	80.

<sup>1</sup> After a licensee has been relocated in accordance with § 78.40, the maximum authorized bandwidth in the frequency band 2025 to 2010 MHz will be 12 megahertz.

[37 FR 3292, Feb. 12, 1972, as amended at 37 FR 15927, Aug. 8, 1972; 38 FR 16648, June 25, 1973; 39 FR 26025, July 16, 1974; 48 FR 50736, Nov. 3, 1983; 49 FR 37779, Sept. 26, 1984; 52 FR 7145, Mar. 9, 1987; 65 FR 48182, Aug. 7, 2000; 68 FR 12776, Mar. 17, 2003; 68 FR 68253, Dec. 8, 2003]

### § 78.104 Authorized bandwidth and emission designator.

(a) The authorized bandwidth permitted to be used by a CARS station and specified in the station license shall be the occupied or necessary bandwidth, whichever is greater, except when otherwise authorized by the Commission in accordance with paragraph (b) of this section.

(b) As an exception to the provision of paragraph (a) of this section, the Commission may approve requests to base the authorized bandwidth for the station on the lesser of the occupied or necessary bandwidth where a persuasive showing is made that:

(i) The frequency stability of the transmitting equipment to be used will permit compliance with § 78.103(b)(1) and, additionally, will permit 99 percent of the total radiated power to be kept within the frequency limits of the assigned channel.

(c) The emission designator shall be specified in terms of the necessary

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bandwidth. (See § 2.201(a) of this chapter.)

[39 FR 26025, July 16, 1974, as amended at 45 FR 78694, Nov. 26, 1980]

### § 78.105 Antenna systems.

(a) For fixed stations operating in the 12.7–13.2 GHz and 17.7–19.7 GHz bands, the following standards apply:

(i) Fixed CARS stations shall use directional antennas that meet the performance standards indicated in the following table.

(i) Stations must employ an antenna that meets the performance standards for Category B. In areas subject to frequency congestion, where proposed facilities would be precluded by continued use of a Category B antenna, a Category A antenna must be employed. The Commission may require the use of a high performance antenna where interference problems can be resolved by the use of such antennas.

(ii) Upon adequate showing of need to serve a larger sector, or more than a single sector, greater beamwidth or multiple antennas may be authorized. Applicants shall request and authorization for stations in this service will specify the polarization of each transmitted signal.

(iii) Licensees shall comply with the antenna standards table shown in this paragraph in the following manner:

(A) With either the maximum beamwidth to 3 dB points requirement or with the minimum antenna gain requirement; and

(B) With the minimum radiation suppression to angle requirement.

#### ANTENNA STANDARDS

Frequency (MHz)	Category	Maximum beamwidth to 3 dB points <sup>1</sup> (included angle 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°
12,700 to 13,250 .....	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 19,700 .....	A	2.2	38	25	29	33	36	42	55	55
	B	2.2	38	20	24	28	32	35	36	36

<sup>1</sup> If a licensee chooses to show compliance using maximum beamwidth to 3 dB points, the beamwidth limit shall apply in both the azimuth and the elevation planes.

(2) New periscope antenna systems that the radiation, in a horizontal plane, from an illuminating antenna will be authorized upon a certification