

Subpart I—General Technical Standards

§ 90.201 Scope.

This subpart sets forth the general technical requirements for use of frequencies and equipment in the radio services governed by this part. Such requirements include standards for acceptability of equipment, frequency tolerance, modulation, emissions, power, and bandwidths. Special additional technical standards applicable to certain frequency bands and certain specialized uses are set forth in subparts J, K, N, and R.

[67 FR 76700, Dec. 13, 2002]

§ 90.203 Certification required.

(a) Except as specified in paragraphs (b) and (l) of this section, each transmitter utilized for operation under this part and each transmitter marketed as set forth in § 2.803 of this chapter must be of a type which has been certificated for use under this part.

(1) Effective October 16, 2002, except in the 1427–1432 MHz band, an equipment approval may no longer be obtained for in-hospital medical telemetry equipment operating under the provisions of this part. The requirements for obtaining an approval for medical telemetry equipment after this date are found in subpart H of part 95 of this chapter.

(2) Any manufacturer of radio transmitting equipment (including signal boosters) to be used in these services may request certification for such equipment following the procedures set forth in subpart J of part 2 of this chapter. Certification for an individual transmitter or signal booster also may be requested by an applicant for a station authorization by following the procedure set forth in part 2 of this chapter. Such equipment if approved will be individually enumerated on the station authorization.

(b) Certification is not required for the following:

(1) Transmitters used in developmental operations in accordance with subpart Q.

(2) Transmitters used for police zone and interzone stations authorized as of January 1, 1965.

(3) Transmitting equipment used in the band 1427–1435 MHz.

(4) Transmitters used in radiolocation stations in accordance with subpart F authorized prior to January 1, 1974, for public safety and land transportation applications (old parts 89 and 93).

(5) Transmitters used in radiolocation stations in accordance with subpart F authorized for industrial applications (old part 91) prior to January 1, 1978.

(6) [Reserved]

(7) Transmitters imported and marketed prior to September 1, 1996 for use by LMS systems.

(c) Radiolocation transmitters for use in public safety and land transportation applications marketed prior to January 1, 1974, must meet the applicable technical standards in this part, pursuant to § 2.803 of this chapter.

(d) Radiolocation transmitters for use in public safety and land transportation applications marketed after January 1, 1974, must comply with the requirements of paragraph (a) of this section.

(e) Except as provided in paragraph (g) of this section, transmitters designed to operate above 25 MHz shall not be certificated for use under this part if the operator can program and transmit on frequencies, other than those programmed by the manufacturer, service or maintenance personnel, using the equipment's external operation controls.

(f) Except as provided in paragraph (g) of this section, transmitters designed to operate above 25 MHz that have been approved prior to January 15, 1988, and that permit the operator, by using external controls, to program the transmitter's operating frequencies, shall not be manufactured in, or imported into the United States after March 15, 1988. Marketing of these transmitters shall not be permitted after March 15, 1989.

(g) Transmitters having frequency programming capability and that are designed to operate above 25 MHz are exempt from paragraphs (e) and (f) of this section if the design of such transmitters:

(1) Is such that transmitters with external controls normally available to

the operator must be internally modified to place the equipment in the programmable mode. Further, while in the programmable mode, the equipment shall not be capable of transmitting. The procedures for making the modification and altering the frequency program shall not be made available with the operating information normally supplied to the end user of the equipment; or

(2) Requires the transmitter to be programmed for frequencies through controls normally inaccessible to the operator; or

(3) Requires equipment to be programmed for frequencies through use of external devices or specifically programmed modules made available only to service/maintenance personnel; or

(4) Requires equipment to be programmed through cloning (copying a program directly from another transmitter) using devices and procedures made available only to service/maintenance personnel.

(h) The requirements of paragraphs (e), (f), and (g) of this section shall not apply if:

(1) The equipment has been designed and manufactured specifically for aircraft use; and

(2) The part 90 certification limits the use of the equipment to operations only under § 90.423.

(i) Equipment certificated after February 16, 1988 and marketed for public safety operation in the 821-824/866-869 MHz bands must have the capability to be programmed for operation on the mutual aid channels as designated in § 90.617(a) of the rules.

(j) Except where otherwise specifically provided for, transmitters operating on frequencies in the 150-174 MHz and 421-512 MHz bands must comply with the following.

(1) Applications for certification received on or after January 1, 2005, for mobile and portable transmitters designed to transmit voice on public safety frequencies in the 150-174 MHz band will be granted only if the mobile/portable equipment is capable of operating on the nationwide public safety interoperability calling channel in the 150-174 MHz band. (See § 90.20(c), (d) of this part.) Applications for certification received on or after January 1, 2005, for

mobile and portable transmitters designed to transmit voice on public safety frequencies in the 450-470 MHz band will be granted only if the mobile/portable equipment is capable of operating on the nationwide public safety interoperability calling channel in the 450-470 MHz band. (See § 90.20(c), (d) of this part.)

(2) Applications for certification received on or after February 14, 1997 will only be granted for equipment with the following channel bandwidths:

(i) 12.5 kHz or less for single bandwidth mode equipment or multi-bandwidth mode equipment with a maximum channel bandwidth of 12.5 kHz;

(ii) 25 kHz for multi-bandwidth mode equipment with a maximum channel bandwidth of 25 kHz if it is capable of operating on channels of 12.5 kHz or less; and

(iii) 25 kHz if the equipment meets the efficiency standard of paragraph (j)(3) of this section.

(3) Applications for part 90 certification of transmitters designed to operate on frequencies in the 150-174 MHz and/or 421-512 MHz bands, received on or after February 14, 1997, must include a certification that the equipment meets a spectrum efficiency standard of one voice channel per 12.5 kHz of channel bandwidth. Additionally, if the equipment is capable of transmitting data, has transmitter output power greater than 500 mW, and has a channel bandwidth of more than 6.25 kHz, the equipment must be capable of supporting a minimum data rate of 4800 bits per second per 6.25 kHz of channel bandwidth.

(4) Applications for certification received on or after January 1, 2005, except for hand-held transmitters with an output power of two watts or less, will only be granted for equipment with the following channel bandwidths:

(i) 6.25 kHz or less for single bandwidth mode equipment;

(ii) 12.5 kHz for multi-bandwidth mode equipment with a maximum channel bandwidth of 12.5 kHz if it is capable of operating on channels of 6.25 kHz or less.

(5) Applications for part 90 certification of transmitters designed to operate on frequencies in the 150-174 MHz and/or 421-512 MHz bands, received on

or after January 1, 2005, must include a certification that the equipment meets a spectrum efficiency standard of one voice channel per 6.25 kHz of channel bandwidth. Additionally, if the equipment is capable of transmitting data, has transmitter output power greater than 500 mW, and has a channel bandwidth of more than 6.25 kHz, the equipment must be capable of supporting a minimum data rate of 4800 bits per second per 6.25 kHz of channel bandwidth.

(6) Modification and permissive changes to certification grants.

(i) The Commission's Equipment Authorization Division will not allow adding a multi-mode or narrowband operation capability to single bandwidth mode transmitters, except under the following conditions:

(A) Transmitters that have the inherent capability for multi-mode or narrowband operation allowed in paragraphs (j)(2) and (j)(4) of this section, may have their grant of certification modified (reissued) upon demonstrating that the original unit complies with the technical requirements for operation; and

(B) New FCC Identifiers will be required to identify equipment that needs to be modified to comply with the requirements of paragraphs (j)(2) and (j)(4) of this section.

(ii) All other applications for modification or permissive changes will be subject to the Rules of part 2 of this chapter.

(7) Transmitters designed for one-way paging operations will be certified with a 25 kHz channel bandwidth and are exempt from the spectrum efficiency requirements of paragraphs (j)(3) and (j)(5) of this section.

(8) The Commission's Equipment Authorization Division may, on a case by case basis, grant certification to equipment with slower data rates than specified in paragraphs (j)(3) and (j)(5) of this section, provided that a technical analysis is submitted with the application which describes why the slower data rate will provide more spectral efficiency than the standard data rate.

(9) Transmitters used for stolen vehicle recovery on 173.075 MHz must comply with the requirements of § 90.20(e)(6).

(10) Transmitters designed to operate in the 150–174 MHz and 421–512 MHz bands that are not equipped with a single-mode or multi-mode function permitting operation with a maximum channel bandwidth of 12.5 kHz or do not meet a spectrum efficiency standard of one voice channel per 12.5 kHz of channel bandwidth shall not be manufactured in, or imported into, the United States after January 1, 2008.

(k) For transmitters operating on frequencies in the 220–222 MHz band, certification will only be granted for equipment with channel bandwidths up to 5 kHz, except that certification will be granted for equipment operating on 220–222 MHz band Channels 1 through 160 (220.0025 through 220.7975/221.0025 through 221.7975), 171 through 180 (220.8525 through 220.8975/221.8525 through 221.8975), and 186 through 200 (220.9275 through 220.9975/221.9275 through 221.9975) with channel bandwidths greater than 5 kHz.

(l) Ocean buoy and wildlife tracking transmitters operating in the band 40.66–40.70 MHz or 216–220 MHz under the provisions of § 90.248 of this part shall be authorized under verification procedure pursuant to subpart J of part 2 of this chapter.

(m) Applications for part 90 certification received after December 31, 2006 will not be granted to transmitters designed to operate in the voice mode on channels designated in §§ 90.531(b)(5) or 90.531(b)(6) that do not provide at least one voice path per 6.25 kHz of spectrum bandwidth.

(n) Transmitters designed to operate in the voice mode on channels designated in §§ 90.531(b)(5) or 90.531(b)(6) that do not provide at least one voice path per 6.25 kHz of spectrum bandwidth shall not be manufactured in, or imported into the United States after December 31, 2006. Marketing of these

transmitters shall not be permitted after December 31, 2006.

[43 FR 54791, Nov. 22, 1978; 44 FR 32219, June 5, 1979, as amended at 50 FR 13606, Apr. 5, 1985; 52 FR 47570, Dec. 15, 1987; 53 FR 1024, Jan. 15, 1988; 54 FR 38681, Sept. 20, 1989; 61 FR 18986, Apr. 30, 1996; 62 FR 2038, Jan. 15, 1997; 62 FR 18926, Apr. 17, 1997; 63 FR 36609, July 7, 1998; 64 FR 43095, Aug. 9, 1999; 65 FR 44008, July 17, 2000; 65 FR 66654, Nov. 7, 2000; 67 FR 41860, June 20, 2002; 67 FR 76700, Dec. 13, 2002; 68 FR 42313, July 17, 2003; 68 FR 68547, Dec. 9, 2003]

§ 90.205 Power and antenna height limits.

Applicants for licenses must request and use no more power than the actual power necessary for satisfactory operation. Except where otherwise specifically provided for, the maximum power that will be authorized to applicants whose license applications for new stations are filed after August 18, 1995 is as follows:

(a) *Below 25 MHz.* For single sideband operations (J3E emission), the maximum transmitter peak envelope power is 1000 watts.

(b) *25–50 MHz.* The maximum transmitter output power is 300 watts.

(c) *72–76 MHz.* The maximum effective radiated power (ERP) for stations operating on fixed frequencies is 300 watts. Stations operating on mobile-only frequencies are limited to one watt transmitter output power.

(d) *150–174 MHz.* (1) The maximum allowable station ERP is dependent upon the station's antenna HAAT and re-

quired service area and will be authorized in accordance with table 1. Applicants requesting an ERP in excess of that listed in table 1 must submit an engineering analysis based upon generally accepted engineering practices and standards that includes coverage contours to demonstrate that the requested station parameters will not produce coverage in excess of that which the applicant requires.

(2) Applications for stations where special circumstances exist that make it necessary to deviate from the ERP and antenna heights in Table 1 will be submitted to the frequency coordinator accompanied by a technical analysis, based upon generally accepted engineering practices and standards, that demonstrates that the requested station parameters will not produce a signal strength in excess of 37 dBu at any point along the edge of the requested service area. The coordinator may then recommend any ERP appropriate to meet this condition.

(3) An applicant for a station with a service area radius greater than 40 km (25 mi) must justify the requested service area radius, which will be authorized only in accordance with table 1, note 4. For base stations with service areas greater than 80 km, all operations 80 km or less from the base station will be on a primary basis and all operations outside of 80 km from the base station will be on a secondary basis and will be entitled to no protection from primary operations.

TABLE 1—150–174MHz—MAXIMUM ERP/REFERENCE HAAT FOR A SPECIFIC SERVICE AREA RADIUS

	Service area radius (km)									
	3	8	13	16	24	32	40	48 ⁴	64 ⁴	80 ⁴
Maximum ERP (w) ¹	1	28	178	2500	2500	2500	500	2500	2500	2500
Up to reference HAAT (m) ³	15	15	15	15	33	65	110	160	380	670

¹ Maximum ERP indicated provides for a 37 dBu signal strength at the edge of the service area per FCC Report R-6602, Fig. 19 (See § 73.699, Fig. 10).

² Maximum ERP of 500 watts allowed. Signal strength at the service area contour may be less than 37 dBu.

³ When the actual antenna HAAT is greater than the reference HAAT, the allowable ERP will be reduced in accordance with the following equation: $ERP_{allow} = ERP_{max} \times (HAAT_{ref} / HAAT_{actual})^2$.

⁴ Applications for this service area radius may be granted upon specific request with justification and must include a technical demonstration that the signal strength at the edge of the service area does not exceed 37 dBu.

(e) *217–220 MHz.* Limitations on power and antenna heights are specified in § 90.259.

(f) *220–222 MHz.* Limitations on power and antenna heights are specified in § 90.729.

(g) *421–430 MHz.* Limitations on power and antenna heights are specified in § 90.279.

(h) *450–470 MHz.* (1) The maximum allowable station effective radiated