

(i) The radar frequency is determined by a nontunable, pulse type magnetron or other fixed tuned device, and

(ii) The radar is capable of being operated exclusively by external controls;

(4) An on board station; or

(5) A ship station operating in the VHF band on board a ship voluntarily equipped with radio and sailing on a domestic voyage.

(b) No radio operator license is required to install a VHF transmitter in a ship station if the installation is made by, or under the supervision of, the licensee of the ship station and if modifications to the transmitter other than front panel controls are not made.

(c) No operator license is required to operate coast telephone stations or marine utility stations.

(d) No radio operator license is required to install a radar station on a voluntarily equipped ship when a manual is included with the equipment that provides step-by-step instructions for the installation, calibration, and operation of the radar. The installation must be made by, or under the supervision of, the licensee of that ship station and no modifications or adjustments other than to the front panel controls are to be made to the equipment.

#### **Sec. 80.179 Unattended operation.**

The following unattended transmitter operations are authorized:

(a) EPIRB operations when emergency conditions preclude attendance of the EPIRB transmitter by a person.

(b) Automatic use of a transmitter during narrow-band direct-printing (NB- DP) operations in accordance with Sec. 80.219.

(c) Automatic use of a transmitter during selective calling operations in accordance with Sec. 80.225.

(d) Automatic use of a transmitter when operating as part of the Automated Maritime Telecommunications System (AMTS), an automated multi-station system for which provisions are contained in this part, or an automated public coast station.

(e) Automatic use of a VHF transmitter to send brief digital communications relating to the condition or safety of vessels while moored when all of the following conditions are met:

(1) The equipment must be using DSC in accordance with CCIR Recommendations 493 and 541 as modified by this section.

(2) Sensors must automatically activate the transmitter only under one or more of the following conditions:

(i) Fire, explosion;

(ii) Flooding;

(iii) Collision;

(iv) Grounding;

(v) Listing, in danger of capsizing;

(vi) Sinking;

(vii) Disabled and adrift; and

(viii) Undesignated condition related to ship safety.

(3) The "ROUTINE" DSC category must be used.

(4) Communications must be selectively addressed to an individual station.

(5) Transmitter output power must not exceed one watt.

(6) The call must employ a fixed format and must be in conformity with Recommendation 493 as follows:

Format specifier: Individual call--symbol 120 sent twice.

Address: 9 digit maritime mobile service identity of called station.

Category: Routine--symbol 100.

Self-identification: 9 digit ship station identity.  
Message 1: Telecommand symbol 126 sent twice.  
Message 2: Telecommand symbol 126 sent 6 times.  
End of sequence: Symbol 127.  
Error-check character: Check sum.

(7) Such transmissions are permitted only on channel 70 and the transmitter must be inhibited automatically whenever there is another call in progress on Channel 70.

(8) The call sequence for any one alarm must not be repeated until after an interval of at least five seconds. Further repetition is permitted only after intervals of at least fifteen minutes each. Repetitions following fifteen- minute waiting intervals must not exceed three.

## **SUBPART E—GENERAL TECHNICAL STANDARDS**

### **Sec. 80.201 Scope.**

This subpart gives the general technical requirements for the use of frequencies and equipment in the maritime services. These requirements include standards for equipment authorization, frequency tolerance, modulation, emission, power and bandwidth.

### **Sec. 80.203 Authorization of transmitters for licensing.**

(a) Each transmitter authorized in a station in the maritime services after September 30, 1986, except as indicated in paragraphs (g), (h) and (i) of this section, must be type accepted by the Commission for part 80 operations. The procedures for certification are contained in Part 2 of this chapter. Transmitters of a model certificated or type approved before October 1, 1986 will be considered authorized for use in ship or coast stations as appropriate.

(b) The external controls, of maritime station transmitters capable of operation in the 156-162 MHz band and manufactured in or imported into the United States after August 1, 1990, or sold or installed after August 1, 1991, must provide for selection of only maritime channels for which the maritime station is authorized. Such transmitters must not be capable of being programmed by station operators using external controls to transmit on channels other than those programmed by the manufacturer, service or maintenance personnel.

(1) Any manufacturer procedures and special devices for programming must only be made available to service companies employing licensed service and maintenance personnel that meet the requirements of Sec. 80.169(a) and must not be made available with information normally provided to consumers.

(2) The channels preprogrammed by manufacturers, service and maintenance personnel for selection by the external controls of a maritime station transmitter must be limited to those channels listed in this Part and the duplex channels listed in Appendix 18 of the international Radio Regulations.

The duplex channels listed in Appendix 18 of the international Radio Regulations must be used only in the specified duplex mode. Simplex operations on Appendix 18 duplex channels that are not in accordance with this Part are prohibited.

(3) Programming of authorized channels must be performed only by a person holding a first or second class radiotelegraph operator's certificate or a general radiotelephone operator's license using any of the following procedures:

- (i) Internal adjustment of the transmitter;
- (ii) Use of controls normally inaccessible to the station operator;
- (iii) Use of external devices or equipment modules made available only to service and maintenance personnel through a service company; and
- (iv) Copying of a channel selection program directly from another transmitter (cloning) using

devices and procedures made available only to service and maintenance personnel through a service company.

(4) VHF maritime radio station transmitters capable of being programmed by station operators by means of external controls that are installed in a maritime station by August 1, 1991, are authorized for use indefinitely at the same maritime station.

(c) All VHF ship station transmitters that are either manufactured in or imported into the United States, on or after August 1, 1993, or are initially installed on or after August 1, 1994, must be equipped with an automatic timing device that deactivates the transmitter and reverts the transmitter to the receive mode after an uninterrupted transmission period of five minutes, plus or minus 10 per cent. Additionally, such transmitters must have a device that indicates when the automatic timer has deactivated the transmitter. VHF ship station transmitters initially installed before August 1, 1994, are authorized for use indefinitely at the same maritime station. VHF hand-held, portable transmitters are not required to comply with the requirements in paragraph (c) of this section except when used as described in Sec. 80.141.

(d) Except for radar equipment, applicants for certification of radio equipment designed to satisfy Part II of Title III of the Communications Act or the Safety Convention must also submit with their application a working unit of the type for which certification is desired. Manufacturers of radar equipment intended for installation on voluntarily equipped ships by persons without FCC operators license must include with their equipment authorization application a manual that provides step-by-step procedures for the installation, calibration, and operation of the radar stations.

(e) Double sideband (DSB) radiotelephone equipment operating in the 1605- 27500 kHz band will be authorized only for use in ship stations. Such equipment must comply with Chapter IV of the Safety Convention, operate only on the frequency 2182 kHz, and be marked "Distress and Safety Use Only".

(f) Transmitters certificated for single sideband suppressed carrier radiotelephone transmissions may be used for facsimile transmissions without filing for a certification modification provided the transmitters retain type acceptance and comply with the applicable standards in this part.

(g) Manufacturers of ship earth station transmitters intended for use in the INMARSAT space segment must comply with the verification procedures given in Part 2 of this chapter. Such equipment must be verified in accordance with the technical requirements provided by INMARSAT and must be type approved by INMARSAT for use in the INMARSAT space segment. The ship earth station input/output parameters, the data obtained when the equipment is integrated in system configuration and the pertinent method of test procedures that are used for type approval of the station model which are essential for the compatible operation of that station in the INMARSAT space segment must be disclosed by the manufacturer upon request of the FCC or the United States Signatory. Witnessing of the type approval tests and the disclosure of the ship earth station equipment design or any other information of a proprietary nature will be at the discretion of the ship earth station manufacturer. Transmitters of a model that was certificated by MARISAT for use in its system will be considered verified for use in the INMARSAT system. However, the continued use of such equipment will not be permitted after September 1, 1991, unless verified under the Commission's procedures.

(h) In addition to the type acceptance requirements contained in Part 2 of this chapter applicants for type acceptance of 406.025 MHz radiobeacons must also comply with the type acceptance procedures contained in Sec. 80.1061 of this part.

(i) Certification is not required for U.S. Government furnished transmitters to fulfill a U.S. Government contract. However, such transmitters must comply with all technical requirements in this part.

(j) Certification is not required for transmitters authorized for developmental stations.

(k) Certification of individual radio transmitters requested by station applicants or licensees must also follow the certification procedure in paragraph (a) of this section. However, operation of such transmitters must be limited to the specific units individually identified on the station authorization.

(l) Ship station transmitters may be certificated for emissions not shown in Sec. 80.205 of this part. However, such emissions are not authorized for use in the United States or for communications with U.S. coast stations.

(m) Ship station MF, HF, and VHF transmitters may employ external or internal devices to send synthesized voice transmissions for distress and safety purposes on any distress and safety frequency authorized for radiotelephony listed in Sec. 80.369 provided the following requirements are met:

(1) The technical characteristics of the distress transmissions must comply with this part.

(2) A transmitter and any internal device capable of transmitting a synthesized voice message must be certificated as an integral unit.

(3) The synthesized voice distress transmission must begin with the words "this is a recording" and should be comprised of at least:

(i) the radiotelephone distress call as described in Sec. 80.315(b) and the ship's position as described in Sec. 80.316(c); or

(ii) the radiotelephone distress message as described in Sec. 80.316(b). If available, the ship's position should be reported as described in Sec. 80.316(c).

(4) Such transmission must be initiated manually by an off-switch that is protected from inadvertent activation and must cause the transmitter to switch to an appropriate distress and safety frequency. The radiotelephone distress call and message described in Secs. 80.203(m)(3)(i) and (ii), respectively, may be repeated. However, the entire transmission including repeats must not exceed 45 seconds from beginning to end. Upon ending the transceiver must return to the receive mode and must not be capable of sending the synthesized distress call for at least thirty seconds. Placing the switch to the off position must stop the distress transmission and permit the transmitter to be used to send and receive standard voice communications.

(5) Use of the microphone must cause the synthesized voice distress transmission to cease and allow the immediate use of the transmitter for sending and receiving standard voice communications.

(n) Applications for type acceptance of all marine radio transmitters operating in the 2-27.5 MHz band or the 156-162 MHz band received on or after June 17, 1999, must have a DSC capability in accordance with Sec. 80.225.

This requirement does not apply to transmitters used with AMTS or hand-held portable transmitters.

#### **Sec. 80.205 Bandwidths.**

(a) An emission designator shows the necessary bandwidth for each class of emission of a station except that in ship earth stations it shows the occupied or necessary bandwidth, whichever is greater. The following table gives the class of emission and corresponding emission designator and authorized bandwidth:

Authorized Class of emission	Emission designator	bandwidth (kHz)
A1A	160HA1A	0.4
A1B /1/	160HA1B	0.4
A1D /12/	16K0A1D	20.0
A2A	2K66A2A	2.8
A2B /1/	2K66A2B	2.8
A2D /12/	16K0A2D	20.0
A3E	6K00A3E	8.0
A3N /2/	2K66A3N	2.8
A3X /3/	3K20A3X	25.0

F1B /4/	280HF1B	0.3
F1B /5/	300HF1B	0.5
F1B /6/	16KOF1B	20.0
F1C	2K80F1C	3.0
F1D /12/	16KOF1D	20.0
F2B /6/	16KOF2B	20.0
F2C /7/	16KOF2C	20.0
F2D /12/	16KOF2D	20.0
F3C	2K80F3C	3.0
F3C /7/	16KOF3C	20.0
F3E /8/	16KOF3E	20.0
F3N /9/	20MOF3N	20,000.0
G1D /12/	16KOG1D	20.0
G2D /12/	16KOG2D	20.0
G3D /10/	16KOG3D	20.0
G3E /8/	16KOG3E	20.0
G3N /3/,/13/	16KOG3N	20.0
H2A	1K40H2A	2.8
H2B /1/	1K40H2B	2.8
H3E /11/	2K80H3E	3.0
H3N	2K66H3N	2.8
J2A	160HJ2A	0.4
J2B /4/	280HJ2B	0.3
J2B	300HJ2B	0.5
J2B /5/	300HJ2B	0.5
J2C	2K80J2C	3.0
J3C	2K80J3C	3.0
J3E /11/	2K80J3E	3.0
J3N	160HJ3N	0.4
NON	NON	0.4
PON	( /12/)	( /12/)
R3E /11/	2K80R3E	3.0

**/1/ On 500 kHz and 2182 kHz A1B, A2B, H2B and J2B emissions indicate transmission of the auto alarm signals.**

**/2/ Applicable only to transmissions in the 405-525 kHz band for direction finding.**

**/3/ Applicable only to EPIRB's.**

**/4/ Radioprinter transmissions for communications with private coast stations.**

**/5/ NB-DP radiotelegraph and data transmissions for communications with public coast stations.**

**/6/ Applicable only to radioprinter and data in the 156-162 MHz band and radioprinter in the 216-220 MHz band.**

**/7/ Applicable only to facsimile in the 156-162 MHz and 216-220 MHz bands.**

/8/ Applicable only when maximum frequency deviation is 5 kHz. See also paragraph (b) of this section.

/9/ Applicable only to marine hand-held radar.

/10/ Applicable only to on-board frequencies for maneuvering or navigation.

/11/ Transmitters approved prior to December 31, 1969, for emission H3E, J3E and R3E and an authorized bandwidth of 3.5 kHz may continue to be operated. These transmitters will not be authorized in new installations.

/12/ Applicable to radiolocation and associated telecommand ship stations operating on 154.585 MHz, 159.480 MHz, 160.725 MHz, 160.785 MHz, 454.000 MHz, and 459.000 MHz; emergency position indicating radiobeacons operating in the 406.000-406.1000 MHz frequency bank; and data transmissions in the 156-162 MHz band.

/13/ Class C EPIRB stations may not be used after February 1, 1999.

(b) For land stations the maximum authorized frequency deviation for F3E or G3E emission is as follows:

- (1) 5 kHz in the 72.0-73.0 MHz, 75.4-76.0 MHz and 156-162 MHz bands;
- (2) 15 kHz for stations which were authorized for operation before December 1, 1961, in the 73.0-74.6 MHz band.

#### **Sec. 80.207 Classes of emission.**

(a) Authorization to use radiotelephone and radiotelegraph emissions by ship and coast stations includes the use of digital selective calling and selective calling techniques in accordance with Sec. 80.225.

(b) In radiotelegraphy communications employing a modulated carrier the carrier must be keyed and modulated by an audio frequency.

(c) Authorization to use single sideband emission is limited to emitting a carrier;

- (1) For full carrier transmitters at a power level between 3 and 6 dB below peak envelope power;
  - (2) For suppressed carrier transmitters at a power level at least 40 dB below peak envelope power;
- and

(3) For reduced or variable level carrier:

(i) In the 1600-4000 kHz band:

(A) For coast station transmitters 18 $\pm$ 2 dB below peak envelope power;

(B) For ship station transmitters installed before January 2, 1982, 16 $\pm$ 2 dB below peak envelope power; and

(C) For ship station transmitters installed after January 1, 1982, 18 $\pm$ 2 dB below peak envelope power.

(ii) In the 4000-27500 kHz band:

(A) For coast station transmitters 18 $\pm$ 2 dB below peak envelope power;

(B) For ship station transmitters installed before January 2, 1978, 16 $\pm$ 2 dB below peak envelope power; and

(C) For ship station transmitters installed after January 1, 1978, 18 $\pm$ 2 dB below peak envelope power.

(d) The authorized classes of emission are as follows:

Types of stations	Classes of emission
<b>Ship Stations /1/</b>	
<b>Radiotelegraphy:</b>	
100-160 kHz	A1A
405-525 kHz	A1A, J2A
1605-27500 kHz:	
Manual	A1A, J2A
DSC	F1B, J2B
NB-DP /14/	F1B, J2B
Facsimile	F1C, F3C, J2C, J3C
156-162 MHz/2/	F1B,F2B,F2C,F3C,F1D,F2D
216-220 MHz /3/	F1B, F2B, F2C, F3C
1626.5-1646.5 MHz (/4/)	
<b>Radiotelephony:</b>	
1605-27500 kHz /5/	H3E, J3E, R3E
27.5-470 MHz /6/	G3D, G3E
1626.5-1646.5 MHz (/4/)	
<b>Radiodetermination:</b>	
285-325 kHz /7/	A1A, A2A
405-525 kHz (Direction Find- ing) /8/	A3N, H3N, J3N, N0N
154-459 MHz /12/	A1D, A2D, F1D, F2D, G1D, G2D
2.4-9.5 GHz	P0N
14.00-14.05 GHz	F3N
<b>Land Stations /1/</b>	
<b>Radiotelegraphy:</b>	
100-160 kHz	A1A
405-525 kHz	A1A, J2A
1605-2850 kHz:	
Manual	A1A, J2A
Facsimile	F1C, F3C, J2C, J3C
Alaska--Fixed	A1A, J2A
4000-27500 kHz:	
Manual	A1A, J2A
DSC	F1B, J2B
NB-DP /14/	F1B, J2B
Facsimile	F1C, F3C, J2C, J3C
Alaska--Fixed	A1A, A2A, F1B, F2B
72-76 MHz	A1A, A2A, F1B, F2B
156-162 MHz/2/	F1B,F2B,F2C,F3C,F1D,F2D
216-220 MHz /3/	F1B, F2B, F2C, F3C

<b>Radiotelephony:</b>	
1605-27500 kHz	H3E, J3E, R3E
72-76 MHz	A3E, F3E, G3E
156-470 MHz	G3E
<b>Radiodetermination:</b>	
2.4-9.6 GHz	P0N
<b>Distress, Urgency and Safety:<sup>/8/9/</sup></b>	
500 kHz <sup>/10/</sup>	A2A and A2B or H2A and H2B
2182 kHz <sup>/10//11/</sup>	A2B, A3B, H2B, H3E, J2B, and J3E
8364 kHz	A2A, H2A
121.500 MHz	A3E, A3X, N0N
123.100 MHz	A3E
156.750 and 156.800 MHz <sup>/13/</sup>	G3E, G3N
243.000 MHz	A3E, A3X, N0N
406.025 MHz	G1D

<sup>/1/</sup> Excludes distress, EPIRBs, survival craft, and automatic link establishment.

<sup>/2/</sup> Frequencies used for public correspondence and in Alaska 156.425 MHz. See Secs. 80.371(c), 80.373(f) and 80.385(b). Transmitters type accepted before January 1, 1994, for G3E emissions will be authorized indefinitely for F2C, F3C, F1D and F2D emissions. Transmitters approved on or after January 1, 1994, will be authorized for F2C, F3C, F1D or F2D emissions only if they are type accepted specifically for each emission designator.

<sup>/3/</sup> Frequencies used in the Automated Maritime Telecommunications System (AMTS). See Sec. 80.385(b).

<sup>/4/</sup> Types of emission are determined by the INMARSAT Organization.

<sup>/5/</sup> Transmitters approved prior to December 31, 1969, for emission H3E, J3E, and R3E and an authorized bandwidth of 3.5 kHz may continue to be operated. These transmitters will not be authorized in new installations.

<sup>/6/</sup> G3D emission must be used only by on-board stations for maneuvering or navigation.

<sup>/7/</sup> Frequencies used for cable repair operations. See Sec. 80.375(b).

<sup>/8/</sup> For direction finding requirements see Sec. 80.375.

<sup>/9/</sup> Includes distress emissions used by ship, coast, EPIRB's and survival craft stations.

<sup>/10/</sup> On 500 kHz and 2182 kHz A1B, A2B, H2B and J2B emissions indicate

transmission of the auto alarm signals.

/11/ Ships on domestic voyages must use J3E emission only.

/12/ For frequencies 154.585 MHz, 159.480 MHz, 160.725 MHz, 160.785 MHz, 454.000 MHz and 459.000 MHz, authorized for offshore radiolocation and related telecommand operations.

/13/ Class C EPIRB stations may not be used after February 1, 1999.

/14/ NB-DP operations which are not in accordance with CCIR Recommendation 625 or 476 are permitted to utilize any modulation, so long as emissions are within the limits set forth in Sec. 80.211(f).

### **Sec. 80.209 Transmitter frequency tolerances.**

(a) The frequency tolerance requirements applicable to transmitters in the maritime services are shown in the following table. Tolerances are given as parts in 10/6/ unless shown in Hz.

Frequency bands and categories of stations	Tolerances /1/
(1) Band 100-525 kHz:	
(i) Coast stations:	
For single sideband emissions	20 Hz.
For transmitters with narrow-band direct printing and data emissions	10 Hz./2/
For transmitters with digital selective calling emissions	10 Hz.
For all other emissions	100
(ii) Ship stations:	
For transmitters with single sideband emissions approved or type approved before November 30, 1977	20 Hz.
For transmitters with other emissions type accepted or type approved before November 30, 1977	1000./5/
For transmitters with narrow-band direct printing and data emissions	10 Hz./2/
For transmitters with digital selective calling emissions	10 Hz./3/
For all other transmitters type accepted or type approved after November 29, 1977	20 Hz.
(iii) Ship stations for emergency only:	
For transmitters type approved before November 30, 1977	3000./5/
For all transmitters approved after November 29, 1977	20 Hz.
(iv) Survival craft stations:	
For transmitters approved before November 30, 1977	5000./5/
For transmitters approved after November 29, 1977	20 Hz.
(v) Radiodetermination stations:	
For all emissions	100.
(2) Band 1600-4000 kHz:	
(i) Coast Stations and Alaska fixed stations:	

For single sideband and facsimile	20 Hz.
For narrow-band direct-printing and data emissions	10 Hz./2/
For digital selective calling emissions	10 Hz.
For all other emissions	50.
(ii) Ship stations:	
For transmitters with narrow-band direct printing and data emissions	10 Hz./2/
For transmitters with digital selective calling emissions	10 Hz./3/
For all other transmitters	20 Hz.
(iii) Survival craft stations:	20 Hz.
(iv) Radiodetermination stations:	
With power 200W or less	20.
With power above 200W	10.
(3) Band 4000-27500 kHz:	
(i) Coast stations and Alaska fixed stations:	
For single sideband and facsimile emissions	20 Hz.
For narrow-band direct printing and data emissions	10 Hz./2/
For digital selective calling emissions	10 Hz.
For Morse telegraphy emissions	10.
For all other emissions	15.
(ii) Ship stations:	
For transmitters with narrow-band direct printing and data emissions	10 Hz./2/
For transmitters with digital selective calling emissions	10 Hz./3/
For all other transmitters	20 Hz.
(iii) Survival craft stations:	50 Hz.
(4) Band 72-76 MHz:	
(i) Fixed stations:	
Operating in the 72.0-73.0 and 75.4-76.0 MHz bands	5.
Operating in the 73.0-74.6 MHz band	50.
(5) Band 156-162 MHz:	
(i) Coast stations:	
For stations licensed to operate with a carrier power:	
Below 3 watts	10.
3 to 100 watts /7/	5.
(ii) Ship stations	10./4/
(iii) Survival craft stations operating on 121.500 MHz	50.
(iv) EPIRBs:	
Operating on 121.500 and 243.000 MHz	50.
Operating on 156.750 and 156.800 MHz	10./6/
(6) Band 216-220 MHz	
(i) Coast Stations:	
For all emissions	5.
(ii) Ship stations:	
For all emissions	5.
(7) Band 400-466 MHz:	
(i) EPIRBs operating on 406.025 MHz	5.
(ii) On-board stations	5.
(iii) Radiolocation and telecommand stations	5.
(8) Band 1626.5-1646.5 MHz:	

(i) Ship earth stations

5.

/1/ Transmitters authorized prior to January 2, 1990, with frequency tolerances equal to or better than those required after this date will continue to be authorized in the maritime services provided they retain approval and comply with the applicable standards of this part.

/2/ The frequency tolerance for narrow-band direct printing and data transmitters installed before January 2, 1992, is 15 Hz for coast stations and 20 Hz for ship stations. The frequency tolerance for narrow-band direct printing and data transmitters approved or installed after January 1, 1992, is 10 Hz.

/3/ Until February 2, 1999, the frequency tolerance for DSC ship station transmitters in the MF and HF bands that were installed before January 2, 1992, is 20 Hz. The frequency tolerance for DSC ship station transmitters in the MF and HF bands type accepted or installed after January 1, 1992, is 10 Hz. After February 1, 1999, the frequency tolerance for all DSC ship station transmitters in the MF and HF bands (regardless of installation date) is 10 Hz.

/4/ For transmitters in the radiolocation and associated telecommand service operating on 154.585 MHz, 159.480 MHz, 160.725 MHz and 160.785 MHz the frequency tolerance is 15 parts in 106.

/5/ This frequency tolerance applies to ship station transmitters until February 1, 1999. Thereafter, the frequency tolerance is 20 Hz.

/6/ Class C EPIRB stations may not be used after February 1, 1999.

/7/ For transmitters operated at private coast stations with antenna heights less than 6 meters (20 feet) above ground and output power of 25 watts or less the frequency tolerance is 10 parts in 10./6/

(b) When pulse modulation is used in land and ship radar stations operating in the bands above 2.4 GHz the frequency at which maximum emission occurs must be within the authorized bandwidth and must not be closer than  $1.5/T$  MHz to the upper and lower limits of the authorized bandwidth where "T" is the pulse duration in microseconds. In the band 14.00-14.05 GHz the center frequency must not vary more than 10 MHz from 14.025 GHz.

(c) For stations in the maritime radiodetermination service, other than ship radar stations, the authorized frequency tolerance will be specified on the license when it is not specified in this Part.

**Sec. 80.211 Emission limitations.**

The emissions must be attenuated according to the following schedule.

(a) The mean power when using emissions H3E, J3E and R3E:

(1) On any frequency removed from the assigned frequency by more than 50 percent up to and including 150 percent of the authorized bandwidth:

at least 25 dB for transmitters installed before February 1, 1992,

at least 28 dB for transmitters installed on or after February 1, 1992;

(2) On any frequency removed from the assigned frequency by more than 150 percent up to and including 250 percent of the authorized bandwidth: At least 35 dB; and

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus  $10\log_{10}$  (mean power in watts) dB.

(b) For transmitters operating in the band 1626.5-1646.5 MHz. In any 4 kHz band the mean power of emissions shall be attenuated below the mean output power of the transmitter as follows:

(1) Where the center frequency is removed from the assigned frequency by more than 50 percent

up to and including 100 percent of the authorized bandwidth: At least 25 dB;

(2) Where the center frequency is removed from the assigned frequency by more than 100 percent up to 250 percent of the authorized bandwidth: At least 35 dB; and

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus  $10\log_{10}$  (mean power in watts) dB.

(c) In any 4 kHz band the peak power of spurious emissions and noise at the input to the transmit antenna must be attenuated below the peak output power of the station as follows:

(1) 125 dB at 1525.0 MHz, increasing linearly to 90 dB at 1612.5 MHz;

(2) 90 dB at 1612.5 MHz increasing linearly to 60 dB at 1624.0 MHz;

(3) 90 dB from 1624.0 MHz to 1650.0 MHz, except at frequencies near the transmitted carrier where the requirements of paragraphs (b)(1) through (3) of this section, apply;

(4) 60 dB at 1650.0 MHz decreasing linearly to 90 dB at 1662.5 MHz;

(5) 90 dB at 1662.5 MHz decreasing linearly to 125 dB at 1752.5 MHz; and

(6) 125 dB outside above range, except for harmonics which must comply with (b)(3) of this section.

(d) The mean power of emissions from radiotelephone survival craft transmitters, 9 GHz search and rescue transponders, and radiotelegraph survival craft transmitters must be attenuated below the mean output power of the transmitter as follows:

(1) 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 dB;

(2) On any frequency removed from the assigned frequency by more than 100 percent of the authorized bandwidth: at least 30 dB.

(e) The mean power of EPIRBs operating on 121.500 MHz, 243.000 MHz and 406.025 MHz must be as follows:

(1) 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 dB;

(2) On any frequency removed from the assigned frequency by more than 100 percent: at least 30 dB.

(f) The mean power when using emissions other than those in paragraphs (a), (b), (c) and (d) of this section:

(1) 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 dB;

(2) 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 dB; and

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus  $10\log_{10}$  (mean power in watts) dB.

(g) Developmental stations must conform to the standards for regular authorized stations.

#### **Sec. 80.213 Modulation requirements.**

(a) Transmitters must meet the following modulation requirements:

(1) When double sideband emission is used the peak modulation must be maintained between 75 and 100 percent;

(2) When phase or frequency modulation is used in the 156-162 MHz and 216- 220 MHz bands the peak modulation must be maintained between 75 and 100 percent. A frequency deviation of +/-5 kHz is defined as 100 percent peak modulation; and

(3) In single sideband operation the upper sideband must be transmitted.

Single sideband transmitters must automatically limit the peak envelope power to their authorized operating power and meet the requirements in Sec. 80.207(c).

(b) Radiotelephone transmitters using A3E, F3E and G3E emission must have a modulation limiter

to prevent any modulation over 100 percent. This requirement does not apply to survival craft transmitters, to transmitters that do not require a license or to transmitters whose output power does not exceed 3 watts.

(c) Coast station transmitters operated in the 72.0-73.0 MHz and 75.4-76.0 MHz bands must be equipped with an audio low-pass filter. The filter must be installed between the modulation limiter and the modulated radio frequency stage. At frequencies between 3 kHz and 15 kHz it must have an attenuation greater than at 1 kHz by at least  $40\log_{10}(f/3)$  dB where "f" is the frequency in kilohertz. At frequencies above 15 kHz the attenuation must be at least 28 dB greater than at 1 kHz.

(d) Ship and coast station transmitters operating in the 156-162 MHz and 216-220 MHz bands must be capable of proper operation with a frequency deviation of  $\pm 5$  kHz when using any emission authorized by Sec. 80.207.

(e) Coast station transmitters operated in the 156-162 MHz band must be equipped with an audio low-pass filter. The filter must be installed between the modulation limiter and the modulated radio frequency stage. At frequencies between 3 kHz and 20 kHz it must have an attenuation greater than at 1 kHz by at least  $60\log_{10}(f/3)$  dB where "f" is the audio frequency in kilohertz. At frequencies above 20 kHz the attenuation must be at least 50 dB greater than at 1 kHz.

(f) Radiodetermination ship stations operating on 154.585 MHz, 159.480 MHz, 160.725 MHz, 160.785 MHz, 454.000 MHz and 459.000 MHz must employ a duty cycle with a maximum transmission period of 60 seconds followed by a minimum quiescent period four times the duration of the transmission period.

(g) Radar stations operating in the bands above 2.4 GHz may use any type of modulation consistent with the bandwidth requirements in Sec. 80.209(b).

(h) Radar transponder coast stations using the 2920-3100 MHz or 9320-9500 MHz band must operate in a variable frequency mode and respond on their operating frequencies with a maximum error equivalent to 100 meters. Additionally, their response must be encoded with a Morse character starting with a dash. The duration of a Morse dot is defined as equal to the width of a space and 1/3 of the width of a Morse dash. The duration of the response code must not exceed 50 microseconds. The sensitivity of the stations must be adjustable so that received signals below -10 dBm at the antenna will not activate the transponder. Antenna polarization must be horizontal when operating in the 9320-9500 MHz band and either horizontal or both horizontal and vertical when operating in the 2920-3100 MHz band. Racons using frequency agile transmitting techniques must include circuitry designed to reduce interference caused by triggering from radar antenna sidelobes.

(i) Variable frequency ship station transponders operating in the 2920-3100 MHz or 9320-9500 MHz band that are not used for search and rescue purposes must meet the following requirements:

(1) Non-selectable transponders must have the following characteristics:

(i) They must respond on all their frequencies with a maximum range error equivalent to 100 meters;

(ii) They must use a Morse encoding of "PS" (dot-dash-dash-dot, dot-dot-dot), meaning "You should not come any closer". The width of a Morse dot is defined as equal to the width of a space and 1/3 of the width of a Morse dash;

(iii) When they employ swept frequency techniques they must not transmit on any frequency for more than 10 seconds in any 120 second period;

(iv) Any range offset of their response must occur during their pause on the fixed frequency;

(v) The duration of the response code must not exceed 50 microseconds;

(vi) The sensitivity of the stations must be adjustable so that received signals below -10 dBm at the antenna input will not activate the transponder;

(vii) Antenna polarization must be horizontal when operating in the 9320- 9500 MHz band and either horizontal or both horizontal and vertical when operating in the 2920-3100 MHz band.

(viii) Transponders using frequency agile techniques must include circuitry designed to reduce interference caused by triggering from radar antenna sidelobes.

(2) Selectable transponders must be authorized under Part 5 of the Commission's rules until standards for their use are developed.

(j) The transmitted signals of search and rescue transponders must cause to appear on a radar display a series of at least 20 equally spaced dots.

(k) The modulation requirements for EPIRB's are contained in Subpart V.

#### **Sec. 80.215 Transmitter power.**

(a) Transmitter power shown on the radio station authorization is the maximum power the licensee is authorized to use. Power is expressed in the following terms:

(1) For single sideband emission: Peak envelope power;

(2) For G3E emission: Carrier power;

(3) For PON and F3N emission: Mean power;

(4) For all emissions in the 1626.5-1646.5 MHz band: equivalent isotropic radiated power.

(5) For all other emissions: the carrier power multiplied by 1.67.

(b) Coast station frequencies below 27500 kHz. The maximum power must not exceed the values listed below.

(1) Public coast stations, except Alaska:

(i) Radiotelegraphy:

100-160 kHz--80kW

405-525 kHz--40kW

2035-2065 kHz--6.6kW

4000-8000 kHz--10kW

8000-9000 kHz--20kW

12000-27500 kHz--30kW

(ii) Radiotelephony:

2000-4000 kHz--day--800W

2000-4000 kHz--night--400W

4000-27500 kHz--10kW

(2) Private coast stations, except in Alaska: 1kW

(3) Coast stations in Alaska, public and private:

405-525 kHz--265W

1605-12000 kHz--150W

(c) Coast station frequencies above 27500 kHz. The maximum power must not exceed the values listed below.

(1) Coast stations:

156-162 MHz--50W /1/, /12/

NOTE /1/ Maximum authorized power at the input terminals of the station antenna.

216-220 MHz /2/

NOTE /2/ See paragraph (h) of this section.

(2) Marine utility stations:

156-162 MHz--10W

(d) Ship station frequencies below 27500 kHz. The maximum power must not exceed the values listed below:

(1) Radiotelegraphy: All ships--2kW /3/

NOTE /3/ For passenger ships 5000 gross tons and over--8kW. For cable repair ships operating on radiodetermination frequencies, 15 watts; see Sec. 80.375(b).

(2) Radiotelephony:

(i) All ships--Great Lakes and Inland Waters--150W

(ii) All ships--Open waters; 2000-4000 kHz--150W  
2182 kHz--emergency, urgency, or safety ship to shore--400W /4/

NOTE /4/ For passenger ships 5000 gross tons and over--1kW.

(iii) All ships--Open waters; 4000-27500 kHz--1.5kW /5/".

(3) Digital selective calling:

All ships 415-526.5 kHz--400 W

All ships 1605-4000 kHz--400 W

All ships 4000-27500 kHz--1.5 kW

NOTE /5/ For passenger ships 5,000 gross tons and over 3kW.

(e) Ship stations frequencies above 27500 kHz. The maximum power must not exceed the values listed below.

(1) Ship stations 156-162 MHz--25W /6/

NOTE /6/ Reducible to 1 watt or less, except for transmitters limited to public correspondence channels and used in an automated system.

Marine utility stations and hand-held portable transmitters 156-162 MHz-- 10W

(2) Ship stations 216-220 MHz--25W /7/

NOTE /7/ Reducible to 2.5 watts or less; see paragraph (i) of this section.

(3) On board stations 456-468 MHz--4W /8/

NOTE /8/ Certification based on a carrier power of 4 watts with transmitter connected to a dummy load of matching impedance. The effective radiated power must not exceed 2 watts.

(4) Ship earth stations 1626.5-1646.5 MHz /9/

NOTE /9/ See paragraph (k) of this section.

(5) Ship radar stations with F3N emission--200 mW

(6) EPIRB--121.500 and 243.00 MHz /10/

NOTE /10/ See Subpart V of this part.

(7) EPIRB--156.750 and 156.800 MHz /10/

(f) Fixed stations. The maximum power must not exceed the values listed below.

(1) Maritime support (receiver test):

R3E and J3C emission--150W

F3E emission--50W

(2) Operational fixed: 72-76 MHz and above 162 MHz /11/

NOTE /11/ See paragraph (l) of this section.

/12/ The frequencies 156.375 MHz and 156.650 MHz are primarily intership frequencies. When authorized for coast stations on a secondary basis, the normal output power must not exceed 1 watt and the maximum output power must not exceed 10 watts.

(3) Alaska--Private fixed:

10-200 kHz--650W

405-525 kHz--265W

1605-12000 kHz--150W

(4) Alaska--Public fixed:

405-525 kHz--1kW

1605-12000 kHz--1kW

(g) The carrier power of ship station radiotelephone transmitters, except portable transmitters, operating in the 156-162 MHz band must be at least 8 but not more than 25 watts. Transmitters that use 12 volt lead acid storage batteries as a primary power source must be measured with a primary voltage between 12.2 and 13.7 volts DC. Additionally, unless otherwise indicated, equipment in radiotelephone ship stations operating in the 156-162 MHz band must meet the following requirements:

(1) All transmitters must be capable of reducing the carrier power to one watt or less;

(2) All remote control units that are used with transmitters manufactured after August 31, 1979, or installed after February 29, 1980, must be capable of causing the carrier power to be reduced to one watt or less;

(3) Except as indicated in (4) of this paragraph, all transmitters manufactured after January 21, 1987, or in use after January 21, 1997, must automatically reduce the carrier power to one watt or less when the transmitter is tuned to 156.375 MHz or 156.650 MHz, and must be provided with a manual override switch which when held by an operator will permit full carrier power operation on 156.375 MHz and 156.650 MHz; (4) Hand-held portable transmitters are not required to comply with the automatic reduction of carrier power in (g)(3) of this section; and

(5) Transmitters dedicated for use on public correspondence duplex channels as additional

equipment to a VHF ship station in the Great Lakes which meet all pertinent rules in this part are not required to reduce their carrier power to one watt.

(h) Coast stations in an AMTS may radiate as follows, subject to the condition that no harmful interference will be caused to television reception except that TV services authorized subsequent to the filing of the AMTS station application will not be protected.

(1) When located more than 169 kilometers (105 miles) from the antenna of a Channel 13 TV station and more than 129 kilometers (80 miles) from the antenna of a channel 10 station, the ERP of coast stations having an antenna height of 61 meters (200 feet) or less above ground must not exceed 1000 watts.

(2) Coast stations located less than 169 kilometers (105 miles) from a Channel 13 TV station, or less than 129 kilometers (80 miles) from a channel 10 station or when using a transmitting antenna height above ground greater than 61 meters (200 feet), must submit a plan to limit interference to TV reception. The plan must include:

(i) A description of the interference contour with identification of the method used to determine this contour; and

(ii) A statement concerning the number of residences within the interference contour. The interference contour includes only areas inside the TV grade B contour with the latter determined assuming maximum permissible TV antenna height and power for broadcast stations and the actual facility parameters for translators and low power TV stations. See Part 73, Subpart E of this chapter for further information on TV grade B contour determination.

(3) When located as described in paragraph (h)(2) of this section, the coast station (or stations affecting the same TV Grade B contour) will be authorized if the applicant's plan has limited the interference contour(s) to fewer than 100 residences or if the applicant:

(i) Shows that the proposed site is the only suitable location;

(ii) Develops a plan to control any interference caused to TV reception within the Grade B contour from its operations; and

(iii) Agrees to make such adjustments in the TV receivers affected as may be necessary to eliminate interference caused by its operations.

(4) The applicant must eliminate any interference caused by its operation to TV reception within the Grade B contour that might develop within 90 days of the time it is notified in writing by the Commission. If this interference is not removed within the 90-day period, operation of the coast station must be discontinued. The licensee is expected to help resolve all complaints of interference, whether inside or outside the Grade B contour.

(5) The transmitter output power must be 50 watts or less.

(i) A ship station must have a transmitter output power not exceeding 25 watts and an ERP not exceeding 18 watts. The transmitter must include the capability to reduce the carrier power to 2.5 watts with a front panel control. The maximum transmitter output power is permitted to be increased to 50 watts under the following conditions:

(1) Increases exceeding 25 watts are made only by radio command from the controlling coast stations; and

(2) The application for an equipment authorization demonstrates that the transmitter output power is 25 watts or less when external radio commands are not present.

(j) A ship installation with a transmitter output power exceeding 25 watts under the conditions of paragraph (i) of this section is exempted from the limitation of 18 watts ERP when operating in specific geographical areas identified in a plan for the use of higher power.

(k) Within the 1626.5-1646.5 MHz band the maximum e.i.r.p by a ship earth station in any direction in the horizontal plane or in the direction of the space station must not exceed +40 dB relative to one watt in any 4 kHz band in the main beam, except upon a satisfactory showing of need for greater power, in which case a maximum of +55 dB relative to one watt may be authorized.

(l) For operational fixed stations using frequencies in the 72-76 MHz band and for other classes of

stations operating above 162.025 MHz, the transmitter power must be specified in the station authorization. Frequencies in the 72-76 MHz band are listed in Sec. 80.381. The operational requirements for 72-76 MHz are contained in Subpart L of this part.

(m) For radiodetermination transmitters using A1D, A2D, F1D, F2D, G1D and G2D emissions on 154.585 MHz, 159.480 MHz, 160.725 MHz, 160.785 MHz, 454.000 MHz and 459.000 MHz the mean output power of the unmodulated carrier must not exceed 25 watts.

(n) For radiodetermination stations operating above 2400 MHz the output power must be as follows:

(1) For radar stations that use F3N emission the mean output power must not exceed 200 milliwatts;

(2) For search and rescue stations the output power must be at least 400 milliwatts peak e.i.r.p.

(3) For all other transponder stations the output power must not exceed 20 watts peak e.i.r.p.

Licensees of non-selectable transponder coast stations operating in the 2920-3100 MHz and 9320-9500 MHz bands must notify in writing the USCG District Commander of any incremental increase of their station's output power above 5 watts peak e.i.r.p.

**Sec. 80.217 Suppression of interference aboard ships.**

(a) A voluntarily equipped ship station receiver must not cause harmful interference to any receiver required by statute or treaty.

(b) The electromagnetic field from receivers required by statute or treaty must not exceed the following value at a distance over sea water of one nautical mile from the receiver:

Frequency of interfering emissions	Field intensity in microvolts per meter
Below 30 MHz	0.1
30 to 100 MHz	.3
100 to 300 MHz	1.0
Over 300 MHz	3.0

or

Deliver not more than the following amounts of power, to an artificial antenna having electrical characteristics equivalent to those of the average receiving antenna(s) use on shipboard:

Frequency of interfering emissions	Power to artificial antenna in microwatts
Below 30 MHz	400
30 to 100 MHz	4,000
100 to 300 MHz	40,000
Over 300 MHz	400,000

**Sec. 80.219 Special requirements for narrowband direct-printing (NB-DP) equipment.**

NB-DP and data transmission equipment installed in ship and coast stations before October 1, 1990, that operates on the frequencies in the 4,000-27,500 kHz bands must be capable of operation in accordance with the technical requirements of either CCIR Recommendation 476 or CCIR Recommendation 625 and may be used indefinitely. Equipment installed on or after October 1, 1990, must be capable of operation in accordance with the technical requirements of CCIR Recommendation 625. NB-DP and data transmission equipment are additionally permitted to utilize any modulation, so long as emissions are within the limits set forth in Sec. 80.211(f) and the equipment is also capable of operation in accordance with CCIR recommendation 625.

**Sec. 80.221 Special requirements for automatically generating the radiotelephone alarm signal.**

(a) Each device for automatically generating the radiotelephone alarm signal must be capable of being disabled to permit the immediate transmission of a distress call and message.

(b) The device must comply with the following requirements:

- (1) The frequency tolerance of each tone must be +/-1.5 percent;
- (2) The duration tolerance of each tone must be +/-50 milliseconds;
- (3) The interval between successive tones must not exceed 50 milliseconds;

and

(4) The amplitude ratio of the tones must be flat within 1.6 dB.

(c) Devices installed on or after January 1, 1983, must comply with the following requirements:

- (1) The frequency tolerance of each tone must be +/-1.5 percent;
- (2) The duration tolerance of each tone must be +/-10 milliseconds;
- (3) The interval between successive tones must not exceed 4 milliseconds;
- (4) The amplitude ratio of the tones must be flat within 1.6 dB;
- (5) The output of the device must be sufficient to modulate the associated transmitter for H2B emission to at least 70 percent, and for J2B emission to within 3 dB of the rated peak envelope power;
- (6) Light from the device must not interfere with the safe navigation of the ship;
- (7) After activation the device must automatically generate the radiotelephone alarm signal for not less than 30 seconds and not more than 60 seconds unless manually interrupted;
- (8) After generating the radiotelephone alarm signal or after manual interruption the device must be immediately ready to repeat the signal;
- (9) The transmitter must be automatically switched from the stand-by condition to the transmit condition at the start and return to the stand-by condition at the conclusion of the radiotelephone alarm signal.

(d) Any device used by a station to automatically generate the radiotelephone alarm signal must be certificated by the Commission.

**Sec. 80.223 Special requirements for survival craft stations.**

(a) Survival craft stations capable of transmitting on:

- (1) 500 kHz must be able to operate with class A2A and A2B or H2A and H2B emissions;
- (2) 2182 kHz must be able to operate with A2B and A3E or H2B and H3E and J2B and J3E emissions;
- (3) 8364 kHz must be able to operate with class A2A or H2A emission; and
- (4) 121.500 MHz must be able to operate with A3E or A3N emission.

(b) Survival craft stations must be able to receive the frequency and types of emission which the transmitter is capable of using. Where the transmitter frequency is 8364 kHz the receiver must be able to receive A1A, A2A and H2A emissions throughout the 8320-8745 kHz band.

(c) Survival craft transmitters operating on 500 kHz or on 8364 kHz must be able to be manually keyed. If provisions are made for automatically transmitting the radiotelegraph alarm signal or the radiotelegraph distress signal, such provisions must meet the requirements in Subpart F of this part.

(d) Any EPIRB carried as part of a survival craft station must comply with the specific technical and performance requirements for its class contained in subpart V of this chapter.

#### **Sec. 80.225 Requirements for selective calling equipment.**

This section specifies the requirements for voluntary digital selective calling (DSC) equipment and selective calling equipment installed in ship and coast stations. Reference to any CCIR Recommendation in this section is to the most recent CCIR approved Recommendation that does not prevent the use of existing equipment.

(a) DSC equipment voluntarily installed in coast or ship stations must meet either the requirements of CCIR Recommendation 493 (including only equipment classes A, B, D, and E) or RTCM Paper 56-95/SC101-STD. DSC equipment must not be used with the sensors referred to in Sec. 80.179(e)(2). DSC equipment used on compulsorily fitted ships must meet the requirements contained in subpart W for GMDSS.

(b) Manufacturers of Class C DSC equipment to be used on United States vessels must affix a clearly discernible permanent plate or label visible from the operating controls containing the following:

Warning. This equipment is designed to generate a digital maritime distress and safety signal to facilitate search and rescue. To be effective as a safety device, this equipment must be used only within communication range of a shore-based VHF marine channel 70 distress and safety watch system. The range of the signal may vary but under normal conditions should be approximately 20 nautical miles.

(c) Selective calling equipment, other than that designed in accordance with paragraph (a) of this section, is authorized as follows:

(1) Equipment used in conjunction with the Automated Maritime Telecommunications System (AMTS) in the band 216-220 MHz,

(2) Equipment used to perform a selective calling function during narrow-band direct-printing (NB-DP) operations in accordance with CCIR Recommendation 476 or 625, and

(3) Equipment functioning under the provisions of Sec. 80.207(a) includes the brief use of radiotelegraphy, including keying only the modulating audio frequency, tone signals, and other signalling devices to establish or maintain communications provided that:

(i) These signalling techniques are not used on frequencies designated for general purpose digital selective calling (DSC) and distress and safety DSC calling as listed in Sec. 80.359;

(ii) The authorized radiotelephone emission bandwidth is not exceeded;

(iii) Documentation of selective calling protocols must be available to the general public; and,

(iv) Harmful interference is not caused to stations operating in accordance with the International Radio Regulations.

#### **Sec. 80.227 Special requirements for protection from RF radiation.**

As part of the information provided with transmitters for ship earth stations, manufacturers of each such unit must include installation and operating instructions to help prevent human exposure to radiofrequency (RF) radiation in excess of the RF exposure guidelines specified in Sec. 1.1307(b) of the Commission's Rules.

**Sec. 80.229 Special requirements for automatic link establishment (ALE).**

Brief signalling for the purposes of measuring the quality of a radio channel and thereafter establishing communication shall be permitted within the 2 MHz-30 MHz band. Public coast stations providing high seas service are authorized by rule to use such signalling under the following conditions:

- (a) The transmitter power shall not exceed 100 W ERP;
- (b) Transmissions must sweep linearly in frequency at a rate of at least 60 kHz per second, occupying any 3 kHz bandwidth for less than 50 milliseconds;
- (c) The transmitter shall scan the band no more than four times per hour;
- (d) Transmissions within 6 kHz of the following protected frequencies and frequency bands must not exceed 10 micro-W peak ERP:
  - (1) Protected frequencies (kHz)

2091.0	4188.0	6312.0	12290.0	16420.0
2174.5	4207.5	8257.0	12392.0	16522.0
2182.0	5000.0	8291.0	12520.0	16695.0
2187.5	5167.5	8357.5	12563.0	16750.0
2500.0	5680.0	8364.0	12577.0	16804.5
3023.0	6215.0	8375.0	15000.0	20000.0
4000.0	6268.0	8414.5	16000.0	25000.0
4177.5	6282.0	10000.0		

- (2) Protected bands (kHz)

4125.0-4128.0  
 8376.25-8386.75  
 13360.0-13410.0  
 25500.0-25670.0

(e) The instantaneous signal, which refers to the peak power that would be measured with the frequency sweep stopped, along with spurious emissions generated from the sweeping signal, must be attenuated below the peak carrier power (in watts) as follows:

- (1) On any frequency more than 5 Hz from the instantaneous carrier frequency, at least 3 dB;
  - (2) On any frequency more than 250 Hz from the instantaneous carrier frequency, at least 40 dB;
- and
- (3) On any frequency more than 7.5 kHz from the instantaneous carrier frequency, at least 43 + 10log<sub>10</sub> (peak power in watts) db.

**SUBPART G--SAFETY WATCH REQUIREMENTS**

**Sec. 80.301 Watch requirements.**

- (a) Each public coast station operating on telegraphy frequencies in the band 405-535 kHz must

maintain a watch for classes A1A, A2B and H2B emissions by a licensed radiotelegraph operator on the frequency 500 kHz for three minutes twice each hour, beginning at x h.15 and x h.45 Coordinated Universal Time (UTC).

(b) Each public coast station licensed to operate in the band 1605-3500 kHz must monitor such frequency(s) as are used for working or, at the licensee's discretion, maintain a watch on 2182 kHz.

(c) Except for distress, urgency or safety messages, coast stations must not transmit on 2182 kHz during the silence periods for three minutes twice each hour beginning at x h.00 and x h.30 Coordinated Universal Time (UTC).

(d) Each public coast station must provide assistance for distress communications when requested by the Coast Guard.

**Sec. 80.302 Notice of discontinuance, reduction, or impairment of service involving a distress watch.**

(a) When changes occur in the operation of a public coast station which include discontinuance, reduction or suspension of a watch required to be maintained on 500 kHz, 2182 kHz, or 156.800 MHz, notification must be made by the licensee to the nearest district office of the U.S. Coast Guard as soon as practicable. The notification must include the estimated or known resumption time of the watch.

**Sec. 80.303 Watch on 156.800 MHz (Channel 16).**

(a) During its hours of operation, each coast station operating in the 156- 162 MHz band and serving rivers, bays and inland lakes except the Great Lakes, must maintain a safety watch on the frequency 156.800 MHz except when transmitting on 156.800 MHz.

(b) A coast station is exempt from compliance with the watch requirement when Federal, State, or Local Government stations maintain a watch on 156.800 MHz over 95% of the coast station's service area. Each licensee exempted by rule must notify the nearest district office of the U.S. Coast Guard at least thirty days prior to discontinuing the watch, or in the case of new stations, at least thirty days prior to commencing service. The Coast Guard may require any coast station to maintain the watch temporarily or permanently. The Coast Guard may also require any coast station to remain capable of either immediately resuming the watch or providing the Coast Guard direct dial-up access to the necessary 156.800 MHz transceiver at no charge so that the Coast Guard can maintain the watch.

(c) If the government station(s) providing the 156.800 MHz watch over the service area of an exempt station temporarily discontinues that watch, the exempt coast station upon receiving notice of this condition must maintain the watch on 156.800 MHz during the discontinuance. Automated maritime communications systems' compliance with this requirement is limited to the use of existing facilities.

**SUBPART H--FREQUENCIES**

**Sec. 80.351 Scope.**

The following sections describe the carrier frequencies and general uses of radiotelegraphy with respect to the following:

--Distress, urgency, safety, call and reply.

--Working.

--Digital selective calling (DSC).

- Narrow-band direct-printing (NB-DP).
- Facsimile.

**Sec. 80.353 General uses--radiotelegraphy.**

- (a) Unless otherwise indicated radiotelegraphy may be used by ship and public coast stations only.
- (b) The signal code for Morse telegraphy must be the international Morse code signals specified in the Telegraph Regulations annexed to the International Telecommunication Convention.
- (c) To facilitate communications, ship stations transmitting by means of radiotelegraphy must use the service abbreviations ("Q" signals) listed in Appendix 14 to the ITU Radio Regulations whenever practicable.
- (d) In order to reduce interference stations must attempt to select calling frequencies which provide the most favorable propagational characteristics for effecting reliable communications.
- (e) Coast stations may apply to use for telegraphy communications any additional coast station frequencies that are allocated for such communications in the 10-27500 kHz band that are not listed in this part. See the Table of Frequency allocations in Sec. 2.106 of this chapter. The use of such frequencies will be authorized initially with a six month provisional period.
- (f) Radiotelegraphy stations communicating with a Government station may transmit on a Government frequency when authorized to do so by the Government station or agency if the emission, bandwidth and frequency tolerance of the non-Government station are within the same limits as the Government station.

**Sec. 80.359 Frequencies for digital selective calling (DSC).**

(a) General purpose calling. The following table describes the calling frequencies for use by authorized ship and coast stations for general purpose DSC. There are three series of paired frequencies. One series is for worldwide use; the other two series are for regional use. The "Series A" designation includes coast stations along, and ship stations in, the Atlantic Ocean, the Gulf of Mexico, and the Caribbean Sea. The "Series B" designation includes stations in any remaining areas. Stations must initiate contact on the appropriate regional frequency depending upon the location of the called station and propagation conditions. Acknowledgement is made on the paired frequency. The worldwide frequencies may be used for international calling, if calls on the appropriate regional frequencies are unsuccessful, or the regional series does not contain the appropriate band (e.g., 2 MHz). During normal working hours, all public coast stations capable of DSC operations must monitor the worldwide and regional frequencies appropriate for its location. The specific frequencies to be monitored will vary with propagation conditions.

**General Purpose DSC**

[In kHz unless otherwise noted]

Worldwide		Series A		Series B	
Ship	Coast	Ship	Coast	Ship	Coast
458.5	455.5				
2189.5	/1/ 2177.0				
4208.0	4219.5	4208.5	4220.0	4209.5	4220.5
6312.5	6331.0	6313.0	6331.5	6313.5	6332.0
8415.0	8436.5	8415.5	8437.0	8416.0	8437.5

12577.5	12657.0	12578.0	12657.5	12578.5	12658.0
16805.0	16903.0	16805.5	16903.5	16806.0	16904.0
18898.5	19703.5	18899.0	19704.0	18899.5	19704.5
22374.5	22444.0	22375.0	22444.5	22375.5	22445.0
25208.5	26121.0	25209.0	26121.5	25209.5	26122.0
/2/ 156.525	/2/ 156.525				

/1/ The frequency 2177.0 kHzs is also available to ship stations for intership calling and acknowledgement of such calls only.

/2/ MHz.

(b) Distress and safety calling. The frequencies 2187.5 kHz, 4207.5 kHz, 6312.0 kHz, 8414.5 kHz, 12577.0 kHz, 16804.5 kHz, and 156.525 MHz may be used for DSC by coast and ship stations on a simplex basis for distress and safety purposes. The provisions and procedures for distress and safety calling are contained in CCIR Recommendation 541 as modified by Sec. 80.103(c) of this part.

(c) Working frequencies. Coast and ship stations may use DSC techniques for general calling purposes on their assigned working frequencies in the 2000- 27500 kHz band and on those frequencies in the 156-162 MHz band which are allocated for maritime control, commercial, non-commercial and public correspondence communications.

**Sec. 80.361 Frequencies for narrow-band direct-printing (NBDP), radioprinter, and data transmissions.**

- (a) \* \* \*
- (b) \* \* \*
- (c) \* \* \*

(d) The frequencies in the 156-162 MHz band available for assignment to public coast stations that are contained in Sec. 80.371(c) of this part are also available for radioprinter and data communications between ship and coast stations using F1B, F2B, F1D, or F2D emission.

**Sec. 80.363 Frequencies for facsimile.**

- (a) \* \* \*

(b) The frequencies in the 156-162 MHz band available for assignment to public coast stations that are contained in Sec. 80.371(c) of this part are also available for facsimile communications between ship and coast stations using F2C or F3C emission.

\* \* \* \* \*

**Sec. 80.365 Scope.**

The following sections describe the carrier frequencies and general conditions of use for the following types of radiotelephony:

- Distress, urgency, safety, call and reply.
- Working.
- Public.
- Private.

**Sec. 80.367 General uses--radiotelephony.**

- (a) Ship stations communicating with foreign coast stations may operate on any frequency designated by that coast station.
- (b) Radiotelephony stations communicating with a Government station may transmit on a Government frequency when authorized to do so by the Government station or agency if the emission, bandwidth and frequency tolerance of the maritime station are within the same limits as the Government station.
- (c) Frequencies assigned to Government radio stations are assignable to non-Government maritime stations for radiotelephony communications with other non-Government stations in connection with activities performed in coordination with or on behalf of the Government.
- (d) Frequencies in the 2000-27500 kHz band will be authorized only to ship stations that in addition are authorized to use frequencies in the 156-162 MHz band.
- (e) Frequencies in the 2000-2850 kHz band will be authorized to private coast stations that in addition are authorized to use frequencies in the 156- 162 MHz band.
- (f) Ship and coast stations authorized to use frequencies in both the 2000- 27500 kHz and 156-162 MHz bands must not use frequencies in the 2000-27500 kHz band for communications with any other station which is within the VHF service range.
- (g) Coast and ship station radiotelephone working frequencies are available for DSC general purpose calling under the provisions of Section Sec. 80.207(a).
- (h) Digital selective calling techniques are not authorized on the frequencies 2182 kHz or 156.800 MHz.

**Sec. 80.371 Public correspondence frequencies.**

- (a) \* \* \*
- (b) \* \* \*
- (c) Working frequencies in the marine VHF 156-162 MHz band. (1)(i) The frequency pairs listed in the table in paragraph (c)(1)(ii) are available for assignment to public coast stations for public correspondence communications with ship stations and units on land.

Working Carrier Frequency  
Pairs in the 156-162 MHz Band  
/1/

Channel designator	Ship transmit	Coast transmit
24	157.200	161.800
84	157.225	161.825
25	157.250	161.850
85/2/	157.275	161.875
26	157.300	161.900
86	157.325	161.925
27	157.350	161.950
87	157.375	161.975
28	157.400	162.000

/1/ For special assignment of frequencies in this band in certain areas of Washington State, the Great Lakes and the east coast of the United States pursuant to arrangements between the United States and Canada, see Subpart B of this part.

/2/ The frequency pair 157.275/161.875 MHz is available for assignment on a primary basis to ship and public coast stations. In Alaska it is also available on a secondary basis to private mobile repeater stations.

(ii) Service areas in the marine VHF 156-162 MHz band are VHF Public Coast Station Areas (VPCs). As listed in the table in this paragraph, VPCs are based on, and composed of one or more of, the U.S Department of Commerce's 172 Economic Areas (EAs). See 60 FR 13114 (March 10, 1995). In addition, the Commission shall treat Guam and the Northern Mariana Islands, Puerto Rico and the United States Virgin Islands, American Samoa, and the Gulf of Mexico as EA-like areas, and has assigned them EA numbers 173-176, respectively. Maps of the EAs and VPCs are available for public inspection and copying at the Public Safety and Private Wireless Division, room 8010, 2025 M Street, NW, Washington, DC. Except as shown in the table, the frequency pairs listed in paragraph (c)(1)(i) of this section are available for assignment to a single licensee in each of the VPCs listed in the table in this paragraph. In addition to the listed EAs listed in the table in this paragraph, each VPC also includes the adjacent waters under the jurisdiction of the United States.

VHF Public coast station areas (VPCs)

VPCs	EAs	Frequency pairs not available for assignment
1 (Northern Atlantic)	1-5, 10	
2 (Mid-Atlantic)	9, 11-23, 25, 42, 46	
3 (Southern Atlantic)	24, 26-34, 37, 38, 40, 41, 174	
4 (Mississippi River)	34, 36, 39, 43-45, 47-53, 67-107, 113, 116-120, 122-125, 127, 130-134, 176	
5 (Great Lakes)	6-8, 54-66, 108, 109	
6 (Southern Pacific)	160-165	
7 (Northern Pacific)	147, 166-170	
8 (Hawaii)	172, 173, 175	
9 (Alaska)	171	
10 (Grand Forks)	110	84, 25.
11 (Minot)	111	84, 25.
12 (Bismarck)	112	84, 25.
13 (Aberdeen)	114	84, 25.
14 (Rapid City)	115	84, 25.
15 (North Platte)	121	84, 25.
16 (Western Oklahoma)	126	25, 85.
17 (Abilene)	128	25, 85.

18 (San Angelo)	129	25, 85.
19 (Odessa-Midland)	135	25, 85.
20 (Hobbs)	136	25, 85.
21 (Lubbock)	137	25, 85.
22 (Amarillo)	138	25, 85.
23 (Santa Fe)	139	84, 25.
24 (Pueblo)	140	84, 25.
25 (Denver-Boulder-Greeley)	141	84, 25.
26 (Scottsbluff)	142	84, 25.
27 (Casper)	143	84, 25.
28 (Billings)	144	84, 25.
29 (Great Falls)	145	84, 25.
30 (Missoula)	146	84, 25.
31 (Idaho Falls)	148	25, 85.
32 (Twin Falls)	149	25, 85.
33 (Boise City)	150	84, 25.
34 (Reno)	151	84, 25.
35 (Salt Lake City-Ogden)	152	25, 85.
36 (Las Vegas)	153	84, 25.
37 (Flagstaff)	154	84, 25.
38 (Farmington)	155	84, 25.
39 (Albuquerque)	156	84, 25.
40 (El Paso)	157	25, 85.
41 (Phoenix-Mesa)	158	84, 25.
42 (Tucson)	159	84, 25.

(iii) Subject to paragraph (c)(3) of this section, each licensee may also operate on 12.5 kHz offset frequencies in areas where the licensee is authorized on both frequencies adjacent to the offset frequency, and in areas where the licensee on the other side of the offset frequency consents to the licensee's use of the adjacent offset frequency.

(2) Any recovered channel pairs will revert automatically to the holder of the VPC license within which such channels are included, except the channel pairs listed in the table in paragraph (c)(1)(ii) of this section. Those channel pairs, and any channel pairs recovered where there is no VPC licensee, will be retained by the Commission for future licensing.

(3) VPC licensees may not operate on Channel 228B (162.0125 MHz), which is available for use in the Coast Guard's Ports and Waterways Safety System (PAWSS)). In addition, within six months of the conclusion of the competitive bidding procedures to determine the licensees in each VPC, the U.S. Coast

Guard shall submit to each licensee of VPCs 1-9 a plan specifying up to two narrowband channel pairs offset 12.5 kHz from the channels set forth in the table in paragraph (c)(1)(i) of this section, for use in the PAWSS. The final selection of the PAWSS channel pairs can be negotiated (if the VPC licensee objects to the Coast Guard proposal, it shall make a counterproposal within three months) and established by an agreement between the parties. All parties are required to negotiate in good faith. If no agreement is reached within one year of the date the Coast Guard submitted its plan, the Coast Guard may petition the Commission to select the channel pairs.

(4) Subject to the requirements of Sec. 80.21, each VPC licensee may place stations anywhere within its region without obtaining prior Commission approval provided:

(i) It provides to co-channel coast station incumbent licensees, and incumbent Private Land Mobile Radio licensees authorized under part 90 of this chapter on a primary basis, protection as defined in subpart P of this part. VPC licensees that share a common border may either distribute the available

frequencies upon mutual agreement or request that the Commission assign frequencies along the common border.

(ii) The locations and/or technical parameters of the transmitters are such that individual coordination of the channel assignment(s) with a foreign administration, under applicable international agreements and rules in this part, is not required.

(iii) For any construction or alteration that would exceed the requirements of Sec. 17.7 of this chapter, licensees must notify the appropriate Regional Office of the Federal Aviation Administration (FAA Form 7460-1) and file a request for antenna height clearance and obstruction marking and lighting specifications (FCC Form 854) with the FCC, Attn: Information Processing Branch, 1270 Fairfield Rd., Gettysburg, PA 17325-7245.

(iv) The transmitters must not have a significant environmental effect as defined by Secs. 1.1301 through 1.1319 of this chapter.

/3/ Within 120 km (75 miles) of the United States/Canada border, in the area of the Puget Sound and the Strait of Juan de Fuca and its approaches, the frequency 157.925 MHz is available for use by ship stations for public correspondence communications only. One hundred twenty kilometers (75 miles) from the United States/Canada border 157.425 MHz is available for intership and commercial communications. Outside the Puget Sound area and its approaches and the Great Lakes, 157.425 MHz is available for communications between commercial fishing vessels and associated aircraft while engaged in commercial fishing activities.

/4/ Except for the frequency pair 157.425/162.025 MHz, these frequencies may be shared with stations in the private land mobile radio service, within the 48 contiguous states, under the terms of operation described in Sec. 90.283 of this chapter.

### **Sec. 80.383 Vessel Traffic Services (VTS) system frequencies.**

This section describes the carrier frequencies available for use in the Coast Guard Vessel Traffic Services (VTS) systems within the designated geographic radio protected areas.

#### **(a) Assigned frequencies:**

##### **Vessel Traffic Control Frequencies**

<b>Carrier frequencies (MHz)</b>	<b>Geographic areas</b>
156.250	Seattle.
156.550	New York, New Orleans,/1/ Houston, Prince William Sound,/3/ Berwick Bay.
156.600	New York, New Orleans,/1/ Houston, San Francisco,/3/Sault Ste. Marie./3/
156.700	New York, New Orleans,/1/ Seattle, San Francisco/2/

/1/ Until further notice, this frequency is available for use as permitted by Sec. 80.373(f), notwithstanding the provisions of footnote 3 that are applicable to the VTS system. Availability is a result of the closure of the VTS system for the port area of New Orleans. If the United States Coast Guard re-establishes this system, the Commission may require operations pursuant to such conditional licenses for this frequency to cease, or may choose not to renew such conditional licenses. All licenses

for this frequency will be expressly conditional upon the continued availability of the frequency for non-VTS use.

/2/ Private coast station licenses for the use of this frequency will not be renewed beyond November 1, 1997. Continued use until expiration must be on a noninterference basis to Coast Guard VTS communications.

/3/ Private coast station licenses for the use of this frequency in this area will expire at the end of the current license term or five years after the adopted date of the final rule, whichever comes first. Continued use until expiration must be on a noninterference basis to Coast Guard VTS communications.

(b) The U.S. Coast Guard designated radio protection areas for VTS are as follows:

(1) New York. The rectangle between north latitudes 40 degrees and 42 degrees and west longitudes 71 degrees and 74 degrees 30 minutes;

(2) New Orleans. The rectangle between North latitudes 27 degrees 30 minutes and 31 degrees 30 minutes and West longitudes 87 degrees 30 minutes and 93 degrees;

(3) Houston. The rectangle between north latitudes 28 degrees 30 minutes and 30 degrees 20 minutes and west longitudes 93 degrees 30 minutes and 96 degrees;

(4) Seattle (Puget Sound). The area encompassed between the United States- Canadian border and a line drawn from 49 degrees North 121 degrees West on the United States-Canadian Border, to 46 degrees 30 minutes North 121 degrees West, then to 46 degrees 30 minutes North 125 degrees West, then to 48 degrees 30 minutes North 125 degrees West, and then east to the United States-Canadian Border;

(5) San Francisco. The rectangle between north latitudes 39 degrees and 37 degrees and west longitudes 120 degrees 50 minutes and 123 degrees 20 minutes; and

(6) Prince William Sound. The rectangle between North latitudes 61 degrees 17 minutes and 59 degrees 22 minutes and West longitudes 149 degrees 39 minutes and 145 degrees 36 minutes.

(7) Sault Ste. Marie. The rectangle between North latitudes 45 degrees and 47 degrees, and West longitudes 83 degrees and 85 degrees.

(8) Berwick Bay. The rectangle between North latitudes 28 degrees 30 minutes and 30 degrees 30 minutes, and West longitudes 90 degrees 50 minutes and 92 degrees.

(c) The use of the frequencies shown in paragraph (a) of this section is permitted in areas outside the Coast Guard radio protection areas provided there is no interference to VTS communications within the VTS areas.

## **SUBPART J--PUBLIC COAST STATIONS**

### **Sec. 80.451 Supplemental eligibility requirements.**

A public coast station license may be granted to any person meeting the citizenship provisions of Sec. 80.15(b).

### **Sec. 80.453 Scope of communications.**

Public coast stations provide ship/shore radiotelephone and radiotelegraph services.

(a) Public coast stations are authorized to communicate:

- (1) With any ship or aircraft station operating in the maritime mobile service, for the transmission or reception of safety communication;
- (2) With any land station to exchange safety communications to or from a ship or aircraft station;
- (3) With Government and non-Government ship and aircraft stations to exchange public correspondence;
- (4) With units on land in accordance with Sec. 80.123.
- (b) Public coast stations are authorized to communicate with a designated station at a remote fixed location where other communication facilities are not available.
- (c) Public coast stations are authorized to transmit meteorological and navigational information of benefit to mariners.
- (d) Each public coast telegraphy station is authorized to communicate with other public coast telegraphy stations to exchange message traffic destined to or originated at mobile stations:
  - (1) To exchange operating signals, brief service messages or safety communication;
  - (2) To exchange message traffic destined for a mobile station when the coast station initially concerned is unable to communicate directly with the mobile station;
  - (3) In the Great Lakes region, to exchange message traffic originated at a mobile station when the use of available point-to-point communication facilities would delay the delivery of such message traffic;
  - (4) Utilization of radiotelegraphy must not incur additional charges or replace available point-to-point communication facilities;
  - (5) Only authorized working frequencies within the band 415 kHz to 5000 kHz must be employed for communications between coast stations;
  - (6) Harmful interference must not be caused to communication between mobile stations and coast stations or between mobile stations.

**Sec. 80.455 Assignment and use of frequencies for manual Morse code telegraphy.**

- (a) The frequencies designated in Secs. 80.355 and 80.357 may be licensed for use by coast stations employing telegraphy.

**Sec. 80.459 Digital selective calling.**

Subpart H of this part lists frequencies assignable for DSC.

**Sec. 80.461 Narrow-band direct-printing.**

Subpart H of this part lists the frequencies assignable to public coast stations for operations with ship stations. Operating procedures are listed in Subpart C of this part.

**Sec. 80.465 Assignment and use of frequencies for telephony.**

Subpart H of this part lists the frequencies available for assignment to public coast stations for telephony operations.

**Sec. 80.467 Duplication of VHF service.**

No duplication of service areas as determined by Subpart P of this part will be permitted by public coast stations operating on the same VHF public correspondence channel. Within the service area of a station, the ratio of desired to undesired co-channel signal strengths on public correspondence channels must be at least 12dB.

**Sec. 80.469 Maritime mobile repeater stations in Alaska.**

(a) Maritime mobile repeater stations are authorized to extend the range of communication between a VHF public coast station located in Alaska and ship stations.

(b) On a secondary basis, maritime mobile repeater stations may be authorized to extend the range of a private coast station:

(1) In an area where VHF common carrier service is not available;

(2) A maritime mobile repeater station license expires 60 days after a public coast station in the area begins service.

(c) Each application for a maritime mobile repeater station must include a statement showing why operational fixed frequencies cannot be employed.

(d) The provisions relating to duplication of service described in Subpart P apply to maritime mobile repeater stations.

(e) The frequencies 157.275 and 161.875 MHz are assignable to maritime mobile repeater stations.

(f) Each maritime mobile repeater station must:

(1) Deactivate automatically within 5 seconds after the signals controlling the station cease; and

(2) During periods when it is not controlled from a manned control point, deactivate automatically not more than 20 minutes after its activation by a mobile unit.

**Sec. 80.471 Discontinuance or impairment of service.**

A public coast station must not discontinue or impair service unless authorized to do so by the Commission.

**SUBPART P--STANDARDS FOR COMPUTING  
PUBLIC COAST STATION VHF COVERAGE**

**Sec. 80.751 Scope.**

This subpart specifies receiver antenna terminal requirements in terms of power, and relates the power available at the receiver antenna terminals to transmitter power and antenna height and gain. It also sets forth the co-channel interference protection that VHF public coast station geographic area licensees must provide to incumbents.

**Sec. 80.753 Signal strength requirements at the service area contour.**

(a) The requirements for reception by a marine VHF shipboard receiver are satisfied if the field strength from the coast station, calculated in accordance with Sec. 80.771 is at least +17 dBu above one microvolt.

(b) These field strengths, voltages and powers at the receiver input are equivalent:

(1) -132 dBW (decibels referred to 1 watt).

(2) 1.8 microvolts across 50 ohms.

(3) +17 dBu (decibels referred to 1 microvolt per meter).

(4) 7 microvolts per meter.

**Sec. 80.755 Applicability.**

Applications for maritime frequencies in the 156-162 MHz band must include a map showing the proposed service area contour. The service area contour must be computed in accordance with the following procedures.

**Sec. 80.757 Topographical data.**

(a) In the preparation of profile graphs and in determining the location and height above sea level of the antenna site, the elevations or contour intervals must be taken from U.S. Geological Survey topographic quadrangle maps, U.S. Army Corps of Engineers maps or Tennessee Valley Authority maps, whichever is the latest, for all areas for which maps are available. If such maps are not published for the area in question, the next best topographic information must be used. The maps used must include the principal area to be served. U.S. Geological Survey topographic quadrangle maps may be obtained from the Eastern Distribution Branch, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA 22202, for maps of areas east of the Mississippi River, including Minnesota, Puerto Rico, and the Virgin Islands, and from the Western Distribution Branch, U.S. Geological Survey, Federal Center, Denver CO 80225, for maps of areas west of the Mississippi River, including Alaska, Hawaii, Louisiana, Guam and American Samoa. Sectional aeronautical charts are available from the Distribution Division, National Ocean Service, Riverdale, MD 20840.

(b) In lieu of maps, the average terrain elevation may be computer generated, using elevations from a 30 second point or better topographic data file such as those available for the U.S. Geological Survey's National Geographic Information Center or the National Oceanic and Atmospheric Administration's National Geophysical Data Center. In case of dispute maps will be used to determine the correct value.

**Sec. 80.759 Average terrain elevation.**

(a)(1) Draw radials from the antenna site for each 45 degrees of azimuth starting with true north. Any such radial which extends entirely over land from the antenna site to the point of +17 dBu field strength need not be drawn.

(2) If the distance from the antenna site to the point of +17 dBu field strength between any of the 45 degrees radials would be less than the distances calculated along these radials, an additional radial between such adjacent radials must be plotted and calculations made in each case. Each additional radial must be that radial along which it appears by inspection that transmission loss would be greatest.

(b) Draw a circle of 16 km (10 statute mile) radius using the antenna site as the center. Divide each radial into 320 meter (0.2 statute mile) increments inside the circumference to the 3.2 km (2 statute mile) point.

(c) Calculate the height above sea level of each 320 meter (0.2 statute mile) division by interpolating the contour intervals of the map, and record the value.

(d) Average the values by adding them and dividing by the number of readings along each radial.

(e) Calculate the height above average terrain by averaging the values calculated for each radial.

**Sec. 80.763 Effective antenna height.**

The effective height of the antenna is the vertical distance between the center of the radiating system above the mean sea level and the average terrain elevation.

**Sec. 80.765 Effective radiated power.**

Effective radiated power is used in computing the service area contour. The effective radiated power is derived from the transmitter output power, loss in the transmission system including duplexers, cavities, circulators, switches and filters, and the gain relative to a half-wave dipole of the antenna system.

**Sec. 80.771 Method of computing coverage.**

Compute the +17 dBu contour as follows:

(a) Determine the effective antenna height above mean sea level according to the procedures in Sec. 80.757-Sec. 80.761.

(b) Determine the effective radiated power according to Sec. 80.765. Determine for each radial the distance from the antenna site to the +17 dBu point of field strength using procedures of Sec. 80.765 and Sec. 80.767.

(c) Plot on a suitable map each point of +17 dBu field strength for all radials and draw the contour by connecting the adjacent points by a smooth curve.

**Sec. 80.773 Co-channel interference protection.**

(a) Where a VHF public coast station geographic area licensee shares a frequency with an incumbent VHF public coast station licensee, the ratio of desired to undesired signal strengths must be at least 12 dB within the service area of the station.

(b) Where a VHF public coast station geographic area licensee shares a frequency with an incumbent private land mobile radio licensee, the VHF public coast station geographic area licensee must provide at least 10 dB protection to the PLMR incumbent's predicted 38 dBu signal level contour. The PLMR incumbent's predicted 38 dBu signal level contour is calculated using the F(50, 50) field strength chart for Channels 7-13 in Sec. 73.699 (Fig. 10a) of this chapter, with a 9 dB correction factor for antenna height differential, and is based on the licensee's authorized effective radiated power and antenna height-above-average-terrain.

Before the  
 Federal Communications Commission  
 Washington, D.C. 20554

In the Matter of )  
 )  
 Applications for Very High Frequency (VHF) )  
 Public Coast Spectrum in the 156-162 MHz )  
 Bands )  
 )

ORDER

Adopted: March 16, 1998

Released: March 17, 1998

By the Chief, Wireless Telecommunications Bureau:

1. By this *Order*, we impose a suspension of acceptance and processing of applications for very high frequency (VHF) public coast spectrum (156-162 MHz), effective March 17, 1998. As an initial matter, we note that the Commission imposed a suspension regarding VHF public coast spectrum applications in the *Second Report and Order and Second Further Notice of Proposed Rulemaking (Second Further Notice)* in PR Docket No. 92-257.<sup>1</sup> The Commission-imposed suspension took effect on June 17, 1997, and was to be effective until March 17, 1998.<sup>2</sup> For the reasons stated herein, we take action to continue suspension of acceptance and processing of VHF public coast applications during the pendency of the PR Docket No. 92-257 proceeding.

2. In the *Second Further Notice*, the Commission proposed service rules for the Maritime Services, including the introduction of geographic area licensing for VHF public correspondence channels.<sup>3</sup> In order to permit the effective resolution of the issues raised in the *Second Further Notice*, the Commission suspended the acceptance of (1) public coast station applications to use VHF spectrum and private land mobile radio applications proposing to share that spectrum for new licenses, (2) amendments to such new license applications, and (3) applications to modify existing licenses, and amendments thereto, except for applications involving renewals, transfers, assignments, and modifications proposing neither to expand a station's service area nor obtain additional public coast VHF spectrum.<sup>4</sup> The Commission also suspended the processing of pending applications for VHF public coast spectrum that either were mutually exclusive with other applications or as to which the period for filing competing applications had not

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<sup>1</sup> Amendment of the Commission's Rules Concerning Maritime Communications, *Second Report and Order and Second Further Notice of Proposed Rulemaking*, PR Docket No. 92-257, 12 FCC Rcd 16949, 17015, 17017-18 (1997).

<sup>2</sup> *Id.*

<sup>3</sup> *Id.* at 16988-91.

<sup>4</sup> *Id.* at 17015.

expired.<sup>5</sup> The Commission further expressly reserved the right to extend the suspension if it did not adopt final rules by the end of the suspension period.<sup>6</sup>

3. To date, the Commission has not adopted final rules in PR Docket No. 92-257. As a result, the same reasons which prompted the Commission to impose the initial suspension remain today.<sup>7</sup> We believe that a continued suspension of acceptance and processing of public coast VHF spectrum applications is warranted in order to facilitate the orderly and effective resolution of the matters pending in this proceeding. We are concerned that, absent such action, the goals underlying initiation of the PR Docket No. 92-257 proceeding might be compromised by the influx of applications for new licenses, as well as modifications to existing licenses, that are inconsistent with the decisions ultimately made by the Commission. Thus, we believe that there is good cause to continue suspension of the acceptance and processing of public coast VHF spectrum applications. This suspension shall remain in effect until sixty days after the final rules enacted in the *Third Report and Order* in Docket No. 92-257 are published in the Federal Register.<sup>8</sup>

4. This decision is procedural in nature and therefore not subject to notice and comment and effective date requirements of the Administrative Procedure Act.<sup>9</sup> Moreover, there is good cause for proceeding in this manner, for to do otherwise would be impractical, unnecessary, and contrary to the public interest because compliance would undercut the purposes of this action.<sup>10</sup>

5. Accordingly, IT IS ORDERED, pursuant to Sections 4(i), 4(j), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 154(j), and 303(r), that there be a continued suspension of the acceptance and processing of applications to use VHF public coast spectrum, effective March 17, 1998. The suspension will continue until sixty days after the final rules enacted in the *Third Report and Order* in Docket No. 92-257 are published in the Federal Register. This action is taken under delegated authority pursuant to Section 0.331 of the Commission's Rules, 47 C.F.R. § 0.331.

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<sup>5</sup> *Id.*

<sup>6</sup> *Id.* at 17015 n.291.

<sup>7</sup> *See id.* at 17015.

<sup>8</sup> This is the date that the final rules shall become effective.

<sup>9</sup> *See* 5 U.S.C. §§ 553(b)(A); *Kessler v. FCC*, 326 F.2d 673 (D.C. Cir. 1963).

<sup>10</sup> *See* 5 U.S.C. §§ 553(b)(B), (d)(3).

6. For further information concerning this *Order*, contact Scot Stone, Policy and Rules Branch, Public Safety and Private Wireless Division, Wireless Telecommunications Bureau, at (202) 418-0680.

FEDERAL COMMUNICATIONS COMMISSION

Daniel B. Phythyon  
Chief, Wireless Telecommunications Bureau



## PARTIAL BIBLIOGRAPHY

Most of the following documents can be found at an FCC web site page.

\*Items with an asterisk are reproduced in this Bidder Information Package.

### **A. Rulemaking to Amend the Commission's Rules Concerning Maritime Communications, PR Docket No. 92-257**

*First Report and Order*, FCC 95-178, 10 FCC Rcd 8419 (rel. May 26, 1995).

\**Second Report and Order*, FCC 97-217, 12 FCC Rcd 16949 (rel. June 26, 1997).

\**Third Report and Order and Memorandum Opinion and Order*, FCC 98-151, 63 FR 40059 (July 27, 1998).

### **B. Applications for Very High Frequency (VHF) Public Coast Spectrum in the 156-165 MHz Band**

\**Order*, DA 98-522, 13 FCC Rcd 5240 (rel. March 17, 1998).

### **C. Rulemaking, Amendment of Part 1 of the Commission's Rules -- Competitive Bidding Procedures, WT Docket No. 97-82**

*Order, Memorandum Opinion and Order and Notice of Proposed Rule Making*, FCC 97-60, 12 FCC Rcd. 5686 (1997), 62 FR 13540 (March 21, 1997).

*Third Report and Order and Second Further Notice of Proposed Rule Making*, FCC 97-413, 13 FCC Rcd. 374 (1997), 63 FR 2315 (Jan. 15, 1998). *Erratum*, 13 FCC Rcd. 4621 (1998).

### **D. Implementation of Section 309(j) of the Communications Act -- Competitive Bidding. PP Docket No. 93-253**

*Second Report and Order*, FCC 94-61, 9 FCC Rcd. 2348 (1994), 59 Fed. Reg. 22980 (May 4, 1994); and *Erratum* (released May 12, 1994).

*Order on Reconsideration*, FCC 94-217, 9 FCC Rcd. 4493 (1994), 59 Fed. Reg. 43062 (Aug. 22, 1994).

*Order on Reconsideration*, FCC 94-240, 9 FCC Rcd. 5306 (1994), 59 Fed. Reg. 50509 (Oct. 4, 1994).

*Fifth Report and Order*, FCC 94-178, 9 FCC Rcd. 5532 (1994), 59 Fed. Reg. 37566 (July 22, 1994).

*Fourth Memorandum Opinion and Order*, FCC 94-264, 9 FCC Rcd. 6858 (1994), 59 Fed. Reg. 53364 (Oct. 24, 1994).

*Second Memorandum Opinion and Order*, FCC 94-215, 9 FCC Rcd. 7245 (1994), 59 Fed.

Reg. 44272 (Aug. 26, 1994); and Erratum, Mimeo No. 50278 (Oct. 19, 1994).

*Memorandum Opinion and Order*, FCC 94-295, 9 FCC Rcd. 7684 (1994), 59 Fed. Reg. 64159 (Dec. 13, 1994).

*Fifth Memorandum Opinion and Order*, FCC 94-285, 10 FCC Rcd. 403 (1994), 59 Fed. Reg. 63210 (Dec. 7, 1994); and Erratum, DA 95-15 (Jan. 10, 1995), 60 Fed. Reg. 5333 (Jan. 27, 1995).

**E. Summary listing of documents from the Commission and the Wireless Telecommunications Bureau addressing application of the anti-collusion rules**

**Commission Decisions:**

*Second Report and Order* in PP Docket No. 93-253, FCC 94-61, 9 FCC Rcd 2348 (1994), paragraphs 221-226.

*Fifth Report and Order* in PP Docket No. 93-253, FCC 94-178, 9 FCC Rcd 5532 (1994), paragraphs 91-92.

*Second Memorandum Opinion and Order* in PP Docket No. 93-253, FCC 94-215, 9 FCC Rcd 7245 (1994), paragraphs 48-55.

*Fourth Memorandum Opinion and Order* in PP Docket No. 93-253, FCC 94-264, 9 FCC Rcd 6858 (1994), paragraphs 47-60.

*Memorandum Opinion and Order* in PP Docket No. 93-253, FCC 94-295, 9 FCC Rcd 7684 (1994), paragraphs 8-12.

In re Commercial Realty St. Pete, *Notice of Apparent Liability for Forfeiture*, 10 FCC Rcd 4277 (1995), paragraphs 19-20; In re Commercial Realty St. Pete, *Memorandum Opinion and Order*, 11 FCC Rcd 15374 (1996).

In the Matter of Amendment of Part 1 of the Commission's Rules -- Competitive Bidding Procedures, Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use, 4660-4685 MHz, *Third Report and Order and Second Further Notice of Proposed Rule Making*, WT Docket No. 97-82, ET Docket No. 94-32, FCC 97-413 (rel. December 31, 1997), paragraphs 155-166.

In re Applications of U S West Communications, Inc. for Facilities in the Broadband PCS D, E and F Blocks, *Notice of Apparent Liability for Forfeiture*, FCC 98-41, 13 FCC Rcd 8286 (1998).

In re Applications of Western PCS BTA I Corp. for Facilities in the Broadband PCS D, E and F Blocks, *Notice of Apparent Liability for Forfeiture*, FCC 98-42, 13 FCC Rcd 8305 (1998).

In re Application of Mercury PCS II, L.P. for Facilities in the Broadband PCS D, E and F Blocks, *Memorandum Opinion and Order*, FCC 98-203 (rel. August 28, 1998) (rescinded NAL on procedural grounds while notifying public that similar, future conduct will subject bidders to sanctions); In re Application of Mercury PCS II, L.P. for Facilities in the Broadband PCS D, E and F Blocks, *Notice of Apparent Liability for Forfeiture*, FCC 97-388, 12 FCC Rcd 17970 (1997)

#### **Wireless Telecommunications Bureau Decisions:**

Amendment of Parts 21 and 74 of the Commission's Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service, *Order*, in PP Docket No. 93-253 and MM Docket No. 94-131, DA 95-2292, 9 FCC Rcd 7665 (Wireless Tel. Bur. 1995).

In re Applications of GWI PCS, Inc. For Authority to Construct and Operate Broadband PCS Systems Operating on Frequency Block C, *Memorandum Opinion and Order*, DA 96-674, 12 FCC Rcd 6441 (Wireless Tel. Bur. 1997).

In re Applications of Mercury PCS II, LLC for Authority to Construct and Operate Broadband PCS Systems on Frequency Blocks D, E, and F, *Memorandum Opinion and Order*, DA 97-1782, 13 FCC Rcd 21316 (Wireless Tel. Bur. 1997).

In re Application of Mercury PCS II, LLC for Authority to Construct and Operate Broadband PCS Systems on Frequency Blocks D, E, and F, *Memorandum Opinion and Order and Order on Reconsideration*, DA 97-2324, 12 FCC Rcd 18093 (Wireless Tel. Bur. 1997)

In re Applications of Nextel License Acquisition Corp. for New 800 MHz Specialized Mobile Radio Licenses, *Memorandum Opinion and Order*, DA 98-1138, 13 FCC Rcd 11983 (Wireless Tel. Bur. 1998).

#### **Public Notices:**

"FCC Staff Clarifies Application of Anti-Collusion Rule to Broadband PCS 'C' Block Reauction," *Public Notice*, DA 96-929, 11 FCC Rcd 7031 (1996).

"Wireless Telecommunications Bureau Clarifies Spectrum Auction Anti-Collusion Rules," *Public Notice*, DA 95-2244, 11 FCC Rcd 9645 (1995).

"Wireless Telecommunications Bureau Provides Guidance on the Anti-Collusion Rule for D, E and F Block Bidders," *Public Notice*, DA 96-1460, 11 FCC Rcd 10134 (1996).

#### **Letters from the Office of General Counsel and Wireless Telecommunications Bureau:**

*Letter to Gary M. Epstein and James H. Barker from William E. Kennard, General Counsel,*

*Federal Communications Commission* (released October 25, 1994).

*Letter to Alan F. Ciamporzero from William E. Kennard, General Counsel, Federal Communications Commission* (released October 25, 1996).

*Letter to R Michael Senkowski from Rosalind K. Allen, Acting Chief, Commercial Radio Division, Wireless Telecommunications Bureau* (released December 1, 1994).

*Letter to Leonard J. Kennedy from Rosalind K. Allen, Acting Chief, Commercial Radio Division, Wireless Telecommunications Bureau* (released December 14, 1994).

*Letter to Jonathan D. Blake and Robert J. Rini from Kathleen O'Brien Ham, Chief, Auctions Division, Wireless Telecommunications Bureau, DA 95-2404, 10 FCC Rcd 13783* (1995).

*Letter to Mark Grady from Kathleen O'Brien Ham, Chief, Auctions Division, Wireless Telecommunications Bureau, DA 96-587, 11 FCC Rcd 10895* (1996).

*Letter to David L. Nace from Kathleen O'Brien Ham, Chief, Auctions Division, Wireless Telecommunications Bureau, DA 96-1566, 11 FCC Rcd 11363* (1996).

*Letter to Mark J. Tauber and Mark J. O'Conner from Kathleen O'Brien Ham, Chief, Auctions Division, Wireless Telecommunications Bureau, DA 97-603* (1997).

*Letter to Elliott J. Greenwald from Christopher J. Wright, General Counsel, Federal Communications Commission* (released April 6, 1998).

Though part of the original bid package, Second Report and Order and Second Further Notice of Proposed Rule Making (FCC 97-217) and Third Report and order and Memorandum Opinion and Order (FCC 98-151) were not scanned and made part this file due to the size of each order. These orders can be found at the Auctions Web site at the following location.:  
[www.fcc.gov/wtb/auctions/coast/coast.html#fc970217](http://www.fcc.gov/wtb/auctions/coast/coast.html#fc970217) and  
[www.fcc.gov/wtb/auctions/coast/coast.html#fc980151](http://www.fcc.gov/wtb/auctions/coast/coast.html#fc980151) .