

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
AMENDMENT OF PARTS 2 AND 97 OF THE)
COMMISSION'S RULES TO CREATE A NEW)
MEDIUM-FREQUENCY ALLOCATION FOR)
THE AMATEUR RADIO SERVICE)

RM- _____
FILED/ACCEPTED

NOV 29 2012

Federal Communications Commission
Office of the Secretary

To: The Commission

PETITION FOR RULE MAKING

ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.401 of the Commission's Rules (47 C.F.R. § 1.401), hereby respectfully requests that the Commission issue, at an early date, a Notice of Proposed Rule Making looking toward the amendment of Parts 2 and 97 of the Commission's Rules as set forth in the attached Appendix, to create a new domestic allocation and new and modified service rules for use by the Amateur Radio Service of the frequency band 472 to 479 kHz. As good cause therefor, ARRL states as follows:

I. Introduction and Background.

1. The subject of a low-frequency (LF)¹ allocation, and/or a medium-frequency (MF)² allocation in the lower portion of that range for the Amateur Radio Service has a long history at

¹ The LF frequency range is commonly defined internationally and domestically as the spectrum between 30 kilohertz and 300 kilohertz.

² The MF frequency range is commonly defined internationally and domestically as the spectrum between 300 kilohertz and 3 megahertz.

the Commission. As yet, however, the Commission has not created either one.³ Presently, the lowest domestic frequency allocation for the Amateur Service (and the only MF allocation) is at 1800-2000 kHz.⁴ There is an Amateur Radio allocation in all other areas of the radio spectrum, providing for experimentation in virtually all types of radio frequency communications. Technical self-training and furtherance of radiocommunications development in the Amateur Service (which is in essence an experimental radio service) would be greatly enhanced by an LF allocation and an allocation in the lower portion of the medium-frequency (MF) range. It is now timely, in response to actions taken at the 2012 World Radiocommunication Conference (WRC) to create a new, domestic MF allocation at 472 to 479 kHz for the Amateur Radio Service. While it is also desirable and timely to have an allocation in the LF portion of the spectrum, that matter is addressed in the *Notice of Proposed Rule Making and Order* just released in ET Docket 12-338.⁵

2. The issue of a domestic LF and/or low MF allocation for the Amateur Service first formally arose in connection with the Commission's preparation for the 1979 World Administrative Radio Conference (WARC). To prepare for that WARC, the Commission issued a series of Notices of Inquiry in Docket 20271. It used the comments received in response to

³ However, on November 19, 2012 the Commission released a *Notice of Proposed Rule Making and Order*, FCC 12-140 in ET Docket number 12-338, proposing, *inter alia*, to create a new Amateur Radio LF allocation domestically at 135.7-137.8 kHz as part of its planned implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2007) (WRC-07). ARRL will address that proposed allocation in its comments in that docket proceeding.

⁴ Per Section 97.301 of the Commission's Rules, Amateur stations regulated by the Commission in ITU Regions 2 and 3 are allocated the band 1800-2000 kHz. For stations within ITU Region 1, the band 1810-1850 kHz is available.

⁵ See, footnote 3 above. As background, a secondary international allocation to the Amateur Radio Service at 135.7-137.8 kHz in all three ITU Regions was adopted in November of 2007 at the 2007 World Radiocommunication Conference (WRC), subject to a one-Watt e.i.r.p. limitation. Amateur operation in several countries has since been authorized, with no reports of harmful interference to the primary services. The United States offered no objection to this international allocation. In ITU Region 2, Canada has allowed its radio Amateurs to operate in the band 135.7-137.8 kHz since December of 2009.

those Notices of Inquiry as the basis for the United States' WARC-79 proposal. Prior to that docket proceeding, the Commission had established an Advisory Committee for Amateur Radio relative to WARC-79 preparations. The Advisory Committee stated, in a report issued May 18, 1976 at Page 50, as follows:

There exists among some amateurs a keen desire to conduct experimentation and communication at low frequencies, as well as at vhf and uhf (sic). The FCC authorizes the operation of low power communication devices in the band 160-190 kHz under Part 15, Subpart D, of its rules. Despite the severe restrictions of one watt power input and a total length not to exceed 15 meters, experimenters have been successful in transmitting over paths of several hundred miles under favorable conditions. An Amateur allocation with less severe restrictions in this band, which is now allocated to the fixed service in Region II but is little used outside of Alaska, would permit amateurs to resume experimentation in a portion of the spectrum which has not been available to them for more than 50 years.

Notwithstanding this recommendation and the filing of extensive comments by ARRL in response to the *Fifth Notice of Inquiry* in that docket proceeding, the Report and Order terminating Docket 20271 (FCC 78-849, released December 28, 1978) concluded that the 160-190 kHz band could not be made available to the Amateur Service due to concerns of interference to power line carrier (PLC) systems:⁶

The radio amateurs were most responsive to the Notices of Inquiry in this Docket. Their attempts to define their spectrum needs as well as to comment on the needs of other radio services provided useful information. Although many of their needs have been accommodated, it has proven impossible to satisfy their desire for a low frequency allocation. Power Line Carrier (PLC) operations and the extreme difficulty of satisfactory frequency coordination due to the unpredictable nature of amateur operations are obstacles to any amateur service allocation being proposed in this spectral range.

⁶ Some frequencies within the range 9-490 kHz are used by electric companies in the United States for PLC applications. These systems are used to control and monitor high voltage transmission lines and associated equipment in such applications as automated meter reading, load control, and demand response.

3. In 1982, in General Docket 82-9, which was initiated to consider establishment of what is now U.S. Footnote 2 (formerly US294) in the Table of Allocations (for the purpose of recognition of PLC systems and to provide for notification by other users of the LF and MF spectrum to utilities), the Commission stated⁷ as follows:

Based on several comments in the proceeding [which] incorrectly speak of coordination rather than notification and of maintaining existing status of PLC relative to other Part 15 users, the Commission seeks to dispel any misunderstanding concerning the intent of this proceeding. Accordingly, the Commission wants to reaffirm its position that this proceeding does not elevate the status of PLCs in any way and that their operation in the band must be on an unprotected, noninterference basis to authorized users operating under Part 15 provisions. Cooperation between parties to the extent practicable is expected but, in any event, the PLC users must realize that in the event conflicts on spectrum usage cannot be resolved on a cooperative basis, their operation on an unprotected, noninterference basis must adjust to meet the requirements of the authorized radio users.

The language in the footnote⁸ was intended to urge, but not require, cooperation in preventing potential interference because the admonition was more in keeping with the nature of a notification action. The Commission eschewed mandatory language requiring cooperation because “the stricter...language could be misinterpreted to convey that Commission or NTIA

⁷ See, *Amendment of Parts 2, 15 and 90 of the Commission’s Rules to Provide Recognition for Power Line Carrier Operations of Electric Utilities in the Bands 10-490 kHz*, Report and Order, 48 Fed. Reg. 5922, 52 Pike & Fischer Radio Regulation 2d 1713 (1983).

⁸ Footnote US2 (formerly, prior to renumbering, US294 which was identically worded) reads as follows:

In the band 9–490 kHz, electric utilities operate Power Line Carrier (PLC) systems on power transmission lines for communications important to the reliability and security of electric service to the public. These PLC systems operate under the provisions of 47 CFR part 15, or Chapter 8 of the *NTIA Manual*, on an unprotected and non-interference basis with respect to authorized radio users. Notification of intent to place new or revised radio frequency assignments or PLC frequency uses in the band 9–490 kHz is to be made in accordance with the Rules and Regulations of the FCC and NTIA, and users are urged to minimize potential interference to the extent practicable. This footnote does not provide any allocation status to PLC radio frequency uses.

intervention for enforcement purposes is expected if parties will not cooperate, a situation which would implicitly elevate the status of PLC operators in an unintended manner.”⁹

4. On October 22, 1998 ARRL filed a Petition for Rule Making¹⁰ seeking LF allocations for the Amateur Service at 135.7-137.8 kHz and 160-190 kHz. The petition noted, with respect to the 135.7-137.8 kHz band, that radio Amateurs in other countries had theretofore been accommodated in that segment. Among those countries were Belgium, Finland, Norway and the United Kingdom. Other countries at the time permitted Amateur Radio experimentation at LF via special or experimental authority. Among them were Germany, Iceland, Italy, Luxembourg and Australia. Allocations were pending at the time in France and Sweden. A 1997 CEPT¹¹ recommendation was the basis for the specific interest in the band 135.7-137.8 kHz in Europe. The justification for the proposed allocation of 160-190 kHz in ARRL’s petition was the fact that numerous radio Amateurs and experimenters were already using that band pursuant to Part 15 rules, which allows operation in that band at up to one watt input power, but with significant antenna size restrictions which severely restrict antenna efficiency, thus compromising most experimentation in that band.

5. The Commission issued a *Notice of Proposed Rule Making* in May of 2002¹² in response to the ARRL Petition, which proposed to allocate the 135.7-137.8 kHz band to the Amateur Service on a secondary basis so as to permit radio Amateurs to experiment “more freely with propagation, antenna design and antenna construction.”¹³ The Commission also specifically found that “...this allocation appeared to be acceptable because the incumbent use of the 135.7-

⁹ Op.cit. *Amendment of Parts 2, 15 and 90 of the Commission’s Rules to Provide Recognition for Power Line Carrier Operations of Electric Utilities in the Bands 10-490 kHz, Report and Order, 48 Fed. Reg. 5922, at ¶12*
¹⁰ RM-9404.

¹¹ European Conference of Postal and Telecommunications Administrations Recommendation 62-01 (Mainz 1997).

¹² *Notice of Proposed Rule Making*, FCC 02-136, 17 FCC Rcd. 8954 (released May 15, 2002).

¹³ 17 FCC Rcd. at 8962-8963.

137.8 kHz band appeared to be very light, and thus a secondary amateur service allocation in this band would likely raise few interference concerns.”¹⁴ It was also noted that the use of LF frequencies generally by unlicensed devices was on an “unprotected, non-interference basis” and that PLC systems are permitted pursuant to Section 15.113 of the Commission’s rules¹⁵ to operate in the 9-490 kHz segment. Because of concerns related to potential interaction between PLC systems and Amateur stations, the Commission did not propose to allocate the 160-190 kHz band to the Amateur Service. Ultimately, in May of 2003, the Commission declined to create the secondary allocation proposed by ARRL in *either* LF band, citing generalized but technically

¹⁴ *Amendment of Parts 2 and 97 of the Commission’s Rules to Create a Low Frequency Allocation for the Amateur Radio Service*, ET Docket No. 02-98, *Report and Order*, 18 FCC Rcd 10258, 10261 (2003); *recon denied*, 19 FCC Rcd. 6536 (2004).

¹⁵ Section 15.113 presently states as follows:

Power line carrier systems.

Power line carrier systems, as defined in § 15.3(t), are subject only to the following requirements:

(a) A power utility operating a power line carrier system shall submit the details of all existing systems plus any proposed new systems or changes to existing systems to an industry-operated entity as set forth in § 90.35(g) of this chapter. No notification to the FCC is required.

(b) The operating parameters of a power line carrier system (particularly the frequency) shall be selected to achieve the highest practical degree of compatibility with authorized or licensed users of the radio spectrum. The signals from this operation shall be contained within the frequency band 9 kHz to 490 kHz. A power line carrier system shall operate on an unprotected, non-interference basis in accordance with § 15.5 of this part. If harmful interference occurs, the electric power utility shall discontinue use or adjust its power line carrier operation, as required, to remedy the interference. Particular attention should be paid to the possibility of interference to Loran C operations at 100 kHz.

(c) Power line carrier system apparatus shall be operated with the minimum power possible to accomplish the desired purpose. No equipment authorization is required.

(d) The best engineering principles shall be used in the generation of radio frequency currents by power line carrier systems to guard against harmful interference to authorized radio users, particularly on the fundamental and harmonic frequencies.

(e) Power line carrier system apparatus shall conform to such engineering standards as may be promulgated by the Commission. In addition, such systems should adhere to industry approved standards designed to enhance the use of power line carrier systems.

(f) The provisions of this section apply only to systems operated by a power utility for general supervision of the power system and do not permit operation on electric lines which connect the distribution substation to the customer or house wiring. Such operation can be conducted under the other provisions of this part.

unsubstantiated concerns in comments filed by the United Telecom Council (UTC) and by an IEEE committee about potential interference to PLC facilities. Those issues are now to be revisited in ET Docket 12-338.¹⁶

II. 472-479 kHz and WRC 2012

6. *None of the Commission's past concerns with Amateur Radio interaction with PLC systems operating at 160-190 KHz or 135.7-137.8 kHz (however valid those concerns might have been at the time) applies or has applied to the band 450-490 kHz.* An international allocation to the Amateur Radio Service at 472-479 kHz was adopted at the 2012 WRC, with an e.i.r.p. limitation of five watts for most of the world.¹⁷ The Final Acts of WRC-12 become effective on January 1, 2013. The allocation was made in fulfillment of WRC-12 agenda item 1.23, considering a secondary allocation to the Amateur Radio Service in the range 415-526.5 kHz. Studies conducted in support of the agenda item considered present and future uses by incumbent services (mobile, including maritime mobile, and aeronautical radiolocation). Several frequency ranges for the allocation were considered.¹⁸ Ultimately, WRC-12 concluded that the range 472-479 kHz offered maximum protection to existing and future applications in these services, consisting primarily of broadcast data transmissions in the maritime mobile service and aeronautical nondirectional beacons in the aeronautical radiolocation service.¹⁹ Several

¹⁶ See footnote 3 above.

¹⁷ Per new international footnote 5.80A, the e.i.r.p. limitation is one Watt within 800 kilometers of the territories of certain countries, including the Russian Federation. Among areas under FCC jurisdiction, this limitation would be applicable only to certain parts of western Alaska. The attached appendix would incorporate these power limitations in the Part 97 rules, and it would as well limit maritime mobile Amateur operation in international waters to a maximum e.i.r.p. of 1 Watt.

¹⁸ The Conference Preparatory Meeting (CPM) report for WRC-12 included methods proposing allocations at 472-487 kHz and both 461-469 and 471-478 kHz. Earlier in the study cycle, 493-510 kHz was considered, and abandoned in response to a contemplated but not yet operational application in the maritime mobile service.

¹⁹ Aside from NAVTEX transmissions on 490 and 518 kHz, ARRL is unaware of other broadcast data transmissions in the maritime mobile service originating in the United States. Nor are aeronautical nondirectional beacons used in the range 472-479 kHz in the United States.

administrations, including Germany, Sweden, the Netherlands, New Zealand, and Monaco, have already authorized Amateur Radio Service operation on the 472-479 kHz band beginning on or in advance of the January 1, 2013 implementation date of the WRC-12 Final Acts.

7. In the United States, the band 472-479 kHz is part of the larger segment 435-495 kHz which is allocated on a primary basis to the Maritime Mobile Service (Federal and non-Federal users) and on a secondary basis for Federal government aeronautical radionavigation. There are no domestic assignments known to ARRL that would conflict with the allocation of the band 472-479 kHz to the Amateur Service and there is almost no PLC operation in this band segment. According to a 2002 article in IEEE Transactions on Power Delivery entitled *Evaluation of the Potential for Power Line Carrier (PLC) to Interfere With Use of the Nationwide Differential GPS Network* (Silva, Michael, Senior Member, IEEE and Whitney, Bruce, Member, IEEE),²⁰ of the 28,816 PLC transmitters that existed in the United States in 1999, only 20 operated anywhere in the band 450-490 kHz.²¹ Of that 40 kHz-wide segment referred to in that article, only 7 kHz is proposed herein to be allocated domestically to the Amateur Radio Service. Therefore, even if any of those 20 PLC transmitters that operated *somewhere* in the 450-490 kHz in 1999 are still operational, and even if any of those which were operating in 1999 and which are still operational are presently operating in the small segment 472-479 kHz, it would surely be a simple matter indeed to retune those very few PLC transmitters less than 4 kilohertz,²² which is less than 1 percent of the available operating frequencies for PLC systems at LF and MF. So,

²⁰ Volume 17, No. 2, April, 2002.

²¹ By contrast, 1,169 transmitters operated at that time at 10-50 kHz; 5,986 operated at 50-100 kHz, 8,788 operated at 100-150 kHz, 8,897 operated at 150-200 kHz, and 989 operated at 250-300 kHz. Above 200 kHz, the number of transmitters drops off very rapidly.

²² The operating bandwidth of PLC transmitters (defined as that within 3 dB of the peak response) is generally less than 3.4 kilohertz, according to the IEEE article cited hereinabove.

very little adjustment would be required, if any would be called for at all, and it would be a simple matter indeed to do so.

8. The five-Watt e.i.r.p. maximum power specification recommended at WRC-12 for this band will not affect the utility of the allocation for radio Amateurs. Given typical antenna efficiencies in this frequency range, Amateur Radio stations operating in this band are likely to fall well within this limit. International footnote 5.80A (Geneva 2012) would impose a one-watt e.i.r.p. limit on United States radio Amateurs only when operating within close proximity to certain countries including the Russian Federation. As a practical matter, only stations in the western part of Alaska or certain maritime mobile Amateur stations could be affected by this limit. As such, ARRL proposes to implement these power limits in the proposed Section 97.313 modified rule as set forth in the attached Appendix. The utilization of narrow bandwidth emissions has proved satisfactory in extensive experimental operation in the vicinity of 500 kHz in the United States.²³ With respect to this band, no reports of harmful interference to the primary services (or to PLC systems) from experimental Amateur operation have been received. Any likelihood of interaction between Amateur stations and PLC systems in this band will be exceptionally low.²⁴

²³ ARRL has sponsored an extensive course of experimentation in the MF spectrum near 500 kHz since 2006. In September of 2006, a group of 23 Amateur stations scattered throughout the United States were permitted to operate in the band 505-510 kHz for a course of experimentation with propagation and interference testing. See, Experimental License WD2XSH, File No. 0105-EX-PL-2005. During the course of this experiment, the number of participating Amateur stations increased to 42 and include all geographic areas of the United States including Alaska and Hawaii. The frequency bands utilized were modified to include the entirety of 461-478 kHz and 495-510 kHz. Emissions, at power levels up to 20 Watts ERP, include 150 HA1A, 62H0J2B, 62H0F1B, and 62H0G1D. This experiment is scheduled to continue through the current license term, which is August 1, 2015. No reports of interference have been received. This is a disciplined program of experimentation with regular reports and analyses of interference potential to other services (including PLC systems) and experimentation with equipment and antennas.

²⁴ See, Hohn, J.W., et al., *Power Line Carrier Practices and Experiences*, IEEE Transactions on Power Delivery, Vol. 10, No. 2, April 1995 (Survey of power utilities shows that authorized RF systems are not an interference

9. Should PLC systems deem it necessary for any reason to continue to utilize this small segment going forward, and to the extent shown to be necessary, ARRL would be willing to maintain a database of Amateur LF operation at 472-479 kHz, and to provide the same to the Commission in accordance with the spirit and intent of Footnote US2, the NTIA Manual²⁵ and the Commission's Part 90 rules.²⁶ However, Footnote US2 makes it clear that PLC systems operating in this band are unprotected, and it would be difficult to imagine why any PLC system would need to continue to operate in this small segment in this area of the spectrum on an ongoing basis. Finally, it is noteworthy that PLC systems are used on transmission systems only, and *not* on distribution systems. It is unlikely therefore that any will be in close proximity to Amateur stations. PLC systems are obligated by the Commission's Rules to "adhere to industry

problem for PLC systems; PLC system operators have little concern about interference from licensed systems; 88 percent of surveyed utilities report no interference problems from LF stations.)

²⁵ The *NTIA Manual*, at Section 8.3.27 of the current revision (May, 2011), states as follows:

8.3.27 Notification in the Bands 10-490 kHz.

1. The frequencies 10-490 kHz are used to operate electric utility Power Line Carrier (PLC) systems on power transmission lines for communications essential to the reliability and security of electric services to the public, in accordance with footnote US294 of the Table of Frequency Allocations and Part 15 of the FCC Rules. PLC systems in this band operate on a noninterference basis to radio systems assigned frequencies by NTIA or licensed by the FCC and are not protected from interference caused by these radio operations.

2. Any electric utility that generates, transmits, or distributes electrical energy for use by the general public by the member of a cooperative organization may operate PLC systems and shall supply, to the FCC/NTIA recognized industry-operated entity, information on all existing, changes to existing, and proposed systems for inclusion in a data base.

a. Such information shall include the frequency, power, location of transmitter(s), location of receivers and other technical and operational parameters, which would characterize the system's potential both to interfere with authorized radio users, and to receive harmful interference from these users.

b. In an agreed format, the industry-operated entity shall inform the NTIA and the FCC of these systems' characteristics prior to implementation of any proposed PLC system and shall provide monthly or periodic lists with supplements of PLC systems.

²⁶ The substance of the NTIA notification requirements is repeated almost verbatim in the FCC's regulations. 47 C.F.R. § 90.35(g) (2009).

approved standards designed to enhance the use of power line carrier systems."²⁷ This is intended to facilitate additional overlay uses of the same LF or MF spectrum. PLC systems are or can be capable of this through the frequency agility of PLC transmitters (either using software-defined radio equipment or by simply notching small segments of the 9-490 kHz band available to them) and more especially by PLC system design in compliance with the immunity standard IEEE-1613. That standard sets a high bar for immunity of PLC systems, and if met, would virtually guarantee that there would be no interaction between Amateur Stations and PLC systems in this range, even if the latter were operated on a co-channel basis. Compliance with this standard is called for by Section 15.113 of the Commission's rules, and PLC devices sold to utilities and placed within substations since 2002 have been subject to this standard. Also, systems operating pursuant to CENELEC standards utilize polite protocols which will delay a PLC transmission if the channel on which the PLC system wishes to transmit senses that the channel is occupied. Given the above factors, and the very small number of PLC systems (if any) that might currently be operating in the narrow range 472-479 kHz, it is suggested that there will be virtually no interaction between the two uses.

10. In terms of the operating parameters and privileges to be afforded United States Amateur Radio licensees in the 472-479 kHz band, the attached appendix proposes to amend Section 97.305(c) of the Commission's Rules to permit use of RTTY and data emissions (as those terms are defined elsewhere in the existing Part 97 regulations). As per the existing Section 97.305(a), radio Amateurs would also be permitted to utilize CW emissions in the band. The attached Appendix proposes to permit General and Amateur Extra Class licensees access to the band. Technician class licensees would not be permitted to utilize the band, however, inasmuch

²⁷ See, 47 C.F.R. §15.113(e).

as Technician class licensees will not have demonstrated any capability to operate in that band due to the dearth of Technician Class examination syllabus items related to MF operations. The maximum permitted power level for this band proposed in the attached Appendix would be either 1 or 5 Watts e.i.r.p. maximum power, consistent with the international allocation made at WRC-12, as is discussed above.

III. Conclusions

11. A secondary, worldwide Amateur Radio Service allocation at 472-479 kHz is contemplated by the ITU Radio Regulations as amended at WRC-12 – a change that was supported by the United States. Such an allocation has been successfully implemented in a number of countries without reported disruption to unlicensed power line carrier systems or otherwise to date. This experience in other countries, the power limitations specifically recommended internationally and proposed herein; and interference avoidance factors discussed hereinabove strongly suggest the compatibility of amateur operation with existing and any future power line carrier systems in the United States in this MF band. Accordingly, ARRL respectfully requests that the Commission create a domestic Amateur Radio allocation at 472-479 kHz pursuant to the attached Appendix, conforming to the allocation status and limitations set forth in the international Radio Regulations.

Therefore, given the foregoing and the Appendix attached hereto, ARRL, the national association for Amateur Radio, respectfully requests that the Commission issue a Notice of Proposed Rule Making looking toward the amendment of Parts 2 and 97 of the Commission's Rules, as set

forth in the attached Appendix, to create a new allocation and appropriate service rules for the use by the Amateur Radio Service of the frequency band 472 to 479 kHz.

Respectfully submitted,

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November 29, 2012

APPENDIX

47 CFR Parts 2 and 97 are amended to read as follows:

1. Section 2.106, the Table of Frequency Allocations, is amended [with respect to the United States Table portion only, pertaining to the frequency range 275-2065 kHz (LF/MF) and international footnotes thereto] to read, in relevant part, as follows:

§ 2.106 Table of Frequency Allocations

Federal Table	Non-Federal Table	FCC Rule Part(s)
435-472 MARITIME MOBILE 5.79 Aeronautical Radionavigation 5.82 US2 US231	435-472 MARITIME MOBILE 5.79 5.82 US2 US231	Maritime (80)
472-479 MARITIME MOBILE 5.79 Aeronautical Radionavigation 5.82 US2 US231	472-479 MARITIME MOBILE 5.79 Amateur 5.80A 5.82 US2 US231	Maritime (80) Amateur (97)
479-495 MARITIME MOBILE 5.79 5.79A Aeronautical Radionavigation 5.82 US2 US231	479-495 MARITIME MOBILE 5.79 5.79A 5.82 US2 US231	Maritime (80)

International Footnotes

5.80A The maximum equivalent isotropically radiated power (e.i.r.p.) of stations in the amateur service using frequencies in the band 472-479 kHz shall not exceed 1 W. Administrations may increase this limit of e.i.r.p. to 5 W in portions of their territory which are at a distance of over 800 km from the borders of Algeria, Saudi Arabia, Azerbaijan, Bahrain, Belarus, China, Comoros, Djibouti, Egypt, United Arab Emirates, the Russian Federation, Iran (Islamic Republic of), Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Uzbekistan, Qatar, Syrian Arab Republic, Kyrgyzstan, Somalia, Sudan, Tunisia, Ukraine and Yemen. In this frequency band, stations in the amateur service shall not cause harmful interference to, or claim protection from, stations of the aeronautical radionavigation service. (WRC 12)

5.82 In the maritime mobile service, the frequency 490 kHz is to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use

of the frequency 490 kHz are prescribed in Articles 31 and 52. In using the band 415-495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz. In using the frequency band 472-479 kHz for the amateur service, administrations shall ensure that no harmful interference is caused on the frequency 490 kHz. (WRC-12)

2. Sections 97.301(b), (c) and (d) are each modified to add, at the beginning of the table in each subsection, the following:

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements, See §97.303, paragraph:
LF	<i>kHz</i>	<i>kHz</i>	<i>kHz</i>	
630m	472-479	472-479	472-479	(u)

3. Section 97.303 is amended to add a new frequency sharing requirement (u) to read as follows:

(u) No amateur station transmitting in the 472-479 kHz segment shall cause harmful interference to any government maritime mobile or aeronautical radionavigation station. No amateur station is protected from interference due to the operation of any such station in either segment.

4. Section 97.305(c) is amended to include, at the beginning of the table, the following:

Wavelength band	Frequencies	Emission Types Authorized	Standards, see §97.307(f), paragraph:
MF:			
630 m	Entire band	RTTY, data	(3)

5. Section 97.313 is amended to include the following two new subsections:

(i) No station may transmit in the 630 m band with a total effective isotropic radiated power exceeding 5 Watts. Transmissions in the 630 m band by amateur stations in Alaska and located within 800 km of the Russian Federation, and transmissions in that band from all shipborne amateur stations in international waters may not exceed a total effective isotropic radiated power of 1 Watt.