

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

In the Matter of)
)
Amendment of Part 97 of the Commission’s Rules) **RM-11767**
to Amend Section 97.317 by Removing Reference to)
the 15 dB Gain Limitation.)

To: The Chief, Wireless Telecommunications Bureau

**COMMENTS OF ARRL, THE NATIONAL ASSOCIATION
FOR AMATEUR RADIO ON PETITION FOR RULEMAKING**

ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.405(a) of the Commission’s Rules [47 C.F.R. § 1.405(a)], hereby respectfully submits its comments in response to the *Petition for Rulemaking* (the Petition) filed on or about April 7, 2016¹ by Expert Linears America, LLC (Petitioner). The Petition proposes that the Commission amend Section 97.317(a)(2) of the Amateur Radio Service rules² in order to eliminate the requirement that, for a manufacturer of external RF power amplifiers to receive a grant of certification therefor, the amplifier must not be capable of amplifying the input RF power (driving signal) by more than 15 dB of gain.³ ARRL strongly supports this Petition and urges that the Commission issue a Notice of Proposed Rule Making at an early date proposing the specific relief requested by Petitioner. In support of the Petition, ARRL states as follows:

¹ The Petition was placed on public notice by the Commission April 27, 2016 (See, Report No. 3041). Therefore, these comments are timely filed.

² 47 C.F.R. §97.317(a)(2)

³ Gain is defined for the purpose of that rule as the ratio of the input RF power to the output RF power of the amplifier where both power measurements are expressed in peak envelope power or mean power.

I. Introduction and Background.

1. The Petition proposes relief that is in the nature of eliminating unnecessary regulatory underbrush, and it continues an effort started by the Commission on its own motion in 2004 in Docket 04-140 to do precisely that. The rule proposed to be eliminated is outdated; it constituted overregulation when it was adopted long ago, and it now substantially limits the flexibility of Amateur Radio operators to experiment with the current generation of software-defined Amateur Radio equipment.⁴ Much earlier, in 1978, the Commission was faced with a major problem of interference caused by illegally operated, 27 megahertz Citizen's Band (CB) radios with external linear amplifiers to television reception. In its effort to address that problem,⁵ the Commission enacted a series of largely redundant and overlapping regulations that, in their overall effect, unnecessarily (and inappropriately) penalized the wholly innocent Amateur Radio operators. There was created a plethora of restrictions on manufacturers of external RF power amplifiers. These restrictions were highly controversial at the time in the Amateur Radio community, and the Reports and Orders adopting them were ultimately adjudicated by the United States Court of Appeals.⁶ The Court, while upholding the Commission's jurisdiction to enact the rules, nevertheless conceded that, "(h)ad we been the rulemakers in this case, we might have been more hesitant in encroaching on the domain of the innocent amateur radio operators."⁷ The Commission in 2004 eliminated some of these unnecessary regulations. The instant Petition proposes the elimination of another of them.

2. Between 1974 and 1978, the number of licensed Citizen's Band Radio operators grew from fewer than 800,000 to more than 14 million. That phenomenon generated the unfortunate

⁴ See, 47 C.F.R. §97.1(b).

⁵ The Commission stated in 1978 that its actions in Dockets 21116 and 21117 were intended to "...stem the flow of large quantities of amplifiers which were being distributed for...illegal use on frequencies in and around the Citizen's Band Radio Service."

⁶ *American Radio Relay League, Inc. v. Federal Communications Commission*, 617 F. 2d 875, 199 U.S. App. D.C. 293 (1980).

⁷ *Id.*, 617 F. 2d at 879.

byproduct of interference to over-the-air television reception and other radio frequency interference (RFI), caused principally by CB operators, licensed and unlicensed, who unlawfully used radio power amplifiers to increase the transmitter power of their CB transceivers from the authorized 4 watts to much higher output power levels. The Commission at the time cited interference statistics ranging from 3 million to 21 million persons suffering television interference. Even before this epidemic level of CB amplifier-caused television interference, the Commission had taken steps to preclude the marketing and use of CB amplifiers.⁸ Part 2 Rules adopted in 1975 included proscriptions: (1) of the marketing of any external amplifier capable of use between 24 and 35 megahertz unless the amplifier could also be used on four other Amateur Radio frequency bands,⁹ and (2) a new CB rule (then Section 95.44, now Section 95.411) which prohibited the use of an external amplifier by any 27 megahertz¹⁰ CB station.

3. These rules were not found to be effective at the time in stemming the tide of illegal CB amplifier sale and use,¹¹ and the number of interference complaints continued to rise in the mid-1970s. In response to this, the Commission in Docket 21116 initiated in February of 1977 a proposal to prohibit the manufacture, importation or marketing of any external amplifier capable of operation on any frequency or frequencies between 24 and 35 megahertz. There was no reference to minimum input (driving) power or other restrictions. In Docket 21117, issued at the same time, the Commission proposed to require type acceptance (now certification) of transmitters and external amplifiers marketed for use in the Amateur Service, even though the number of instances of

⁸ *Amendment of Parts 2 and 95 of Commission Rules, External Radio Frequency Power Amplifiers*, 50 FCC 2d 310, amended 53 FCC 2d 66 (1975).

⁹ i.e. 7.0-7.3 MHz, 14.0-14.35 MHz, 21.0-21.45 MHz and 28.0-29.7 MHz. The rule adopted at the time was Section 2.815 (47 C.F.R. §2.815).

¹⁰ Initially, HF CB operation was on 23 discrete channels between 26.96 MHz and 27.26 MHz. In 1976, the band was expanded to 40 channels between 26.96 MHz and 27.41 MHz.

¹¹ This was largely due to the resultant marketing by unscrupulous manufacturers of “broadband linear amplifiers” which were capable of amplifying 4-watt signals on any frequency or frequencies between 7 and 29.7 MHz and which were marketed only to CB users. These amplifiers exhibited even worse interference potential than did other amplifiers due to their generation of stronger spurious signals including second and third harmonics.

television interference cases due to misuse of Amateur equipment was minimal. The proposed rules setting forth technical standards for a grant of type acceptance for external amplifiers pertained only to specific authorized bandwidths and spurious emissions. Then Commission Chairman Wiley noted the unreasonableness of the proposals with respect to Amateur Radio operators:

My concern is that, in attempting to deal with the rapidly proliferating and sometimes troublesome CB service, we may appear to be penalizing the amateur community which, in my judgment, is one of the most “professional” and self-regulated services within the Commission’s jurisdiction.

4. The Commission, on March 20, 1978, released its *Report and Order* in Dockets 21116 and 21117.¹² It adopted a series of rules calling for type acceptance of external RF power amplifiers for use in the Amateur Service operating below 144 MHz and including certain standards for grants of type acceptance. These included gain limitations (which are at issue in the instant Petition) as well as spurious emission limits and a 50-watt minimum drive power requirement. The Report and Order also included a ban on linear amplifiers capable of operation on any frequency between 24 and 35 megahertz. Of these requirements, then Commissioner White stated in a partial dissenting opinion with respect to the *Report and Order* as follows:

The type acceptance proposal is all that is necessary, at this time, to effectuate the Commission’s prohibitions regarding the manufacture, marketing, importation, and use of linear amplifiers which are capable of being used illegally with CB sets...But the use of linear amplifiers with CB sets is already illegal.

The gain restrictions and the minimum drive power requirement, and the ban of Amateur amplifiers that can operate between 24 and 35 megahertz did not apply to individual Amateur Radio operators who wished to construct their own amplifiers for their own use, or to modify purchase used or otherwise acquire an RF power amplifier. It only applied to manufacturers of amplifiers.

¹² See the *Report and Order*, FCC 78-107, 67 FCC 2d 939 (1978).

II. The Docket 04-140 Rule Modifications.

5. During the period between 1978 and 2006, 27 MHz CB use and CB-related television interference dropped markedly. Both business and personal radio users who at the beginning of that period might have used 27 MHz CB radio migrated to cellular, Part 90 land mobile, GMRS, FRS, MURS and other Part 95 radio services. At the same time, over-the-air television reception has to a great extent given way to satellite and cable video delivery services, and illegal amplifier use with CB radio is no longer the serious television interference problem that it was when the Docket 21116/21117 rules were adopted. As such, in 2004, in a docket proceeding addressing a multitude of Amateur Radio Service rules and related Part 2 rules based largely on petitions filed by Amateur Service licensees, the Commission proposed *on its own motion* to eliminate the most restrictive of the 1978 rules dealing with Amateur Radio Service amplifiers. In a *Notice of Proposed Rule Making* released in 2004 in WT Docket 04-140,¹³ the Commission asked whether it should amend Sections 97.315 and 97.317 of the Amateur Service Rules in order “to clarify and simplify those restrictions.” Specifically, the Commission asked whether it should eliminate the disparate restrictions imposed on manufacturers (which were not imposed on amateur service licensees), so as to allow manufacturers to market equipment in the United States that they may market overseas, and whether or not to eliminate the requirements in Section 97.315 of the Rules that a manufacturer must design an amplifier to (1) use a minimum of fifty watts drive power and (2) not be capable of operating on any frequency between 24 MHz and 35 MHz.¹⁴ Additionally, the Commission requested comment on whether it should eliminate the definition of an external RF power amplifier kit in Section 97.3(a)(19) of our Rules, because the rules did not draw a bright line delineating when any random group of electronic parts could be reasonably

¹³ *Amendment of Part 97 of the Commission’s Rules Governing the Amateur Radio Services, Notice of Proposed Rulemaking and Order*, 19 FCC Rcd. 7293 (2004).

¹⁴ 19 FCC Rcd at 7329 ¶ 85.

determined to constitute an external RF power amplifier kit. There was no change proposed to Section 95.411 of the Commission's Citizen's Radio Service rules, which prohibits Citizen's Radio Service stations from attaching to a CB transceiver an external RF power amplifier or any device capable of amplifying the signal of a CB transceiver. That rule remains in place today.

6. The Docket 04-140 *Notice of Proposed Rulemaking and Order* did not specifically make reference to the 15 dB limit on gain of Amateur Radio external power amplifiers, which by that time appeared in the Amateur Service rules as Section 97.317(c)(6)(ii). However, that *Notice of Proposed Rulemaking and Order* did ask whether the Commission should amend Section 97.317 generally. In the *Report and Order*¹⁵ issued in that proceeding, no further mention of amendment of Section 97.317 was made, but the Commission decided to "clarify and simplify Sections 97.315 and 97.317 of the Rules" in several respects. The Commission agreed with comments filed by ARRL that the requirements imposed on amateur radio operators by those rules are in some ways unnecessary because, under the two rules at issue at the time, "the equipment, once authorized, can be modified to transmit on all amateur service frequency allocations,"¹⁶ and that revising the rule "will enhance use of the 12 and 10 m(eter) amateur bands, and allow amateur radio operators to construct equipment without unnecessary restrictions."¹⁷ ARRL also noted, and the Commission agreed, that before a manufacturer could market an amplifier capable of transmitting on the 12-meter or 10-meter¹⁸ Amateur Service bands, it would have to have the amplifier certificated under the Part 2 equipment authorization rules.¹⁹ The Commission also cited other comments arguing that eliminating the fifty-watt

¹⁵ *Amendment of Part 97 of the Commission's Rules Governing the Amateur Radio Services, Report and Order*, 21 FCC Rcd. 11643 (2006), .

¹⁶ See ARRL Comments in WT Docket 04-104, at 21.

¹⁷ *Id.*

¹⁸ i.e. 24.890-24.930 MHz and 28.000-29.700 MHz respectively.

¹⁹ 47 C.F.R. Part 2, Subpart J.

minimum drive power requirement would permit more flexibility in the operation of low-powered transceivers, and that eliminating the rule will reduce the cost and complexity of commercially produced amateur service amplifiers because manufacturers will not have to make a domestic model and an export model of the same product.

7. Thus, the Commission decided to revise its rules to allow manufacturers of Amateur Radio equipment to market RF power amplifiers that are capable of operating in the 12m and 10m amateur bands without a minimum drive power requirement, but to continue to require that they design such products to avoid operation on CB Radio Service frequencies. Since the rules were adopted in 1978, methods of preventing RF equipment from transmitting on frequencies other than those intended have been developed and they are, generally speaking, sufficient to address the illegal CB use issue. The Commission noted, however, that as of 2006 it still received complaints of interference to television service that are attributable to overpowered operation by CB radio operators. In order to prevent the use of amateur radio amplifiers by CB operators, it found specifically that it is necessary to continue to require that manufacturers of amateur radio amplifiers design their products to avoid operation on the CB frequencies. It therefore decided to retain the requirement that amplifiers exhibit no amplification capability between 26 MHz and 28 MHz and require manufacturers to certify that amplifiers are not capable of amplification between 26 MHz and 28 MHz and are not easily modifiable to operate between 26 MHz and 28 MHz prior to the grant of an equipment certification. Not one word was mentioned, however, justifying the continued necessity of the 15 dB gain requirement for linear amplifiers.

III. There is No Justification for Continuing the 15 dB Gain Limit for Amateur Amplifiers.

8. Indeed, precisely the same rationale for elimination of the 50-watt minimum drive power rule in 2006 applies to the elimination of the 15 dB gain rule for Amateur amplifiers. There are current rules that, separately and in the aggregate, are sufficient to keep illegal amplifiers out of the hands of 27 megahertz CB operators who might misuse them without unnecessarily restricting the continually rule-abiding radio Amateurs. The current Section 97.317 of the Commission's Rules reads as follows:

§ 97.317 Standards for certification of external RF power amplifiers.

(a) To receive a grant of certification, the amplifier must:

(1) Satisfy the spurious emission standards of § 97.307 (d) or (e) of this part, as applicable, when the amplifier is operated at the lesser of 1.5 kW PEP or its full output power and when the amplifier is placed in the standby or off positions while connected to the transmitter.

(2) Not be capable of amplifying the input RF power (driving signal) by more than 15 dB gain. Gain is defined as the ratio of the input RF power to the output RF power of the amplifier where both power measurements are expressed in peak envelope power or mean power.

(3) Exhibit no amplification (0 dB gain) between 26 MHz and 28 MHz.

(b) Certification shall be denied when:

(1) The Commission determines the amplifier can be used in services other than the Amateur Radio Service, or

(2) The amplifier can be easily modified to operate on frequencies between 26 MHz and 28 MHz.

There is no continued justification for retaining the 15 dB gain limitation. Instead, the Commission can rely on the more objective, existing standard calling for no amplification between 26 and 28 megahertz; the certification requirement that prohibits the utility of an amplifier for use in radio services other than the Amateur Service; and the determination of the ability of the amplifier to be

easily modified to operate on frequencies between 26 and 28 megahertz. On the CB rules side, Section 95.411 of the Commission's rules (CB Rule 11)²⁰ provides additional objective rules sufficient to preclude the use of RF power amplifiers with a CB transceiver:

§ 95.411 (CB Rule 11) May I use power amplifiers?

(a) You may not attach the following items (power amplifiers) to your certificated CB transmitter in any way:

(1) External radio frequency (RF) power amplifiers (sometimes called linears or linear amplifiers); or

(2) Any other devices which, when used with a radio transmitter as a signal source, are capable of amplifying the signal.

(b) There are no exceptions to this rule and use of a power amplifier voids your authority to operate the station.

(c) The FCC will presume you have used a linear or other external RF power amplifier if

(1) It is in your possession or on your premises; and

(2) There is other evidence that you have operated your CB station with more power than allowed by CB Rule 10, § 95.410.

(d) Paragraph (c) of this section does not apply if you hold a license in another radio service which allows you to operate an external RF power amplifier.

9. Finally, the equipment authorization rules²¹ that implement the service rule standards relative to grants of certification for external RF power amplifiers and which are applicable to manufacturers are sufficient to preclude a grant of certification to an Amateur Radio Service amplifier that is capable of operation with a CB transceiver or on a frequency between 26 and 28 megahertz. Neither of those equipment authorizations rules makes reference to the 15 dB gain limit of Section 97.317. Section 2.815 of the Commission's Rules reads as follows:

²⁰ 47 C.F.R. §95.411

²¹ 47 C.F.R. §2.815(b) and 47 C.F.R. §1060(c).

§ 2.815 External radio frequency power amplifiers.

(a) As used in this part, an external radio frequency power amplifier is any device which, (1) when used in conjunction with a radio transmitter as a signal source is capable of amplification of that signal, and (2) is not an integral part of a radio transmitter as manufactured.

(b) No person shall manufacture, sell or lease, offer for sale or lease (including advertising for sale or lease) or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any external radio frequency power amplifier capable of operation on any frequency or frequencies below 144 MHz unless the amplifier has received a grant of certification in accordance with subpart J of this part and other relevant parts of this chapter. These amplifiers shall comply with the following:

(1) The external radio frequency power amplifier shall not be capable of amplification in the frequency band 26-28 MHz.

(2) The amplifier shall not be capable of easy modification to permit its use as an amplifier in the frequency band 26-28 MHz.

(3) No more than 10 external radio frequency power amplifiers may be constructed for evaluation purposes in preparation for the submission of an application for a grant of certification.

(4) If the external radio frequency power amplifier is intended for operation in the Amateur Radio Service under part 97 of this chapter, the requirements of §§ 97.315 and 97.317 of this chapter shall be met.

Section 2.1060(c) of the Commission's Rules reads as follows:

§ 2.1060 Equipment for use in the amateur radio service.

(c) Certification of external radio frequency power amplifiers may be denied when denial would prevent the use of these amplifiers in services other than the Amateur Radio Service.

10. The 15 dB gain rule should therefore be eliminated as unnecessary for the same reasons stated by the Commission in Docket 04-140 in the 2006 *Report and Order* for the elimination of the 50-watt minimum drive power requirement. As the Petitioner notes accurately, there is a current

generation of low powered Amateur Radio transceivers, including software-defined Amateur equipment which cannot be operated at full legal power with a single amplifier due to the 15 dB limitation on amplification. It should not be necessary to configure an Amateur Radio station to include an additional amplifier stage in order to make use of current SDR technology in the Amateur Service.

Therefore, given the foregoing, ARRL, the national association for Amateur Radio joins with the Petitioner in this proceeding and respectfully requests that the Commission timely issue a *Notice of Proposed Rule Making* proposing to modify Section 97.317 of the Commission's Rules so as to delete Subsection (a)(2) therefrom.

Respectfully submitted,

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