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## **I. Background of the Petitioner**

The Personal Radio Steering Group, Inc. (PRSG) is an all-volunteer, not-for-profit corporation established in 1980 by licensees in the General Mobile Radio Service (GMRS, FCC Part 95A) to provide services to and to serve as an advocate for the GMRS personal-use community. The PRSG is the continuation of the GMRS Task Area of the Congressionally-chartered FCC Personal Use Radio Advisory Committee (PURAC, 1976-1978).

The PRSG has published more than 300 different guides to GMRS licensing, technology and operating practices. PRSG's flagship publication, the GMRS National Repeater Guide, lists the more than 3,500 GMRS repeaters, their sponsors, technical characteristics and detailed coverage information. The Guide has become the essential reference to this cooperative, nonprofit communications network for licensed private individuals. PRSG also works closely with major land mobile equipment manufacturers to disseminate instructional materials for radio purchasers.

The PRSG tracks GMRS applications and grants. We provide 24-hour on-line access to the national GMRS licensing database of over 35,000 stations, in support of the FCC requirement that all system licensees must cooperate in the selection and use of channels.<sup>1</sup> PRSG staff members and volunteers regularly answer questions about GMRS licensing and usage over the Internet and other national computer networks.

PRSG has extensive experience in responding to inquiries and complaints about improper GMRS operations, and offering suggestions for resolution of conflicts between GMRS users. This experience uniquely qualifies us to anticipate problems that will occur in the FRS, and to request certain changes in the FRS Rules intended to minimize improper FRS operations.

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1 §95.7(a).

## II. Introduction

In the *Notice of Proposed Rulemaking*, the FCC established certain principles concerning how the FRS should be used. In the *Report and Order*, certain additional guidelines were implicitly recognized. These principles and guidelines include the following:

- 1) That the FRS is intended only for very short distance communications.<sup>2</sup>
- 2) That spectrum must be shared amongst all users.<sup>3</sup> Users must always yield to emergency communications pertaining to the immediate safety of life or property.<sup>4</sup>
- 3) That interconnection with the Public Switched Network is not permitted.<sup>5</sup>
- 4) That regulation of usage should be primarily by technical standards rather than by complex operating rules.<sup>6</sup>
- 5) That only voice communications are permitted.<sup>7</sup>
- 6) That FRS operation is intended for portable, person-carried use.<sup>8</sup>

PRSG supports these criteria. The requests for reconsideration in this petition are intended to produce rules more consistent with these goals, while recognizing the regulatory and operational environments within which the FRS will be used.

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2 For instance, see the *NPRM* at §1, and the *R&O* at §19.

3 For instance, see the *R&O* at §8.

4 For instance, see FRS Rule 3, §95.193(d).

5 For instance, see the *R&O* at §18.

6 For instance, see the *R&O* at §17.

7 For instance, see the *R&O* at §1.

8 For instance, see the *NPRM* at §19.

### III. FRS Repeaters Must Be Prohibited.

The FCC intends that the FRS provide communications only over *a very short distance*. This is the primary limitation of this radio service. FRS users frustrated with this limitation can be expected to seek ways to extend communications range of FRS units.

The *R&O* addresses the issue of duplexed operation in the context of interconnection with the PSN<sup>9</sup>, and correctly concludes that permitting interconnection would reduce the number of channels available and lengthen the time each channel is in use.

However, nowhere does the *R&O* address the issue of FRS *repeaters*, another form of usually duplexed operation. An FRS unit with a voice-actuated ("VOX") transmitter would become an FRS repeater merely by locating that FRS unit in the immediate vicinity of a audio speaker from a receiver tuned to some other radio frequency. That other receiver could even be attached to a commercial-grade, high-gain antenna mounted on the building rooftop or on a tall tower. There is no effective way to limit the kind of antenna used to *receive* signals from FRS transmitters. Nor is there any effective way to limit the frequencies to which receivers with advantageously mounted antennas can be tuned.

By using a "store-and-forward" audio device completely *external* to the FRS unit, a "time-domain" FRS repeater could retransmit signals even on the very same FRS frequency. This would not require the use of a second frequency, but would *more than double* the time occupancy of the same channel.

An FRS unit positioned on the interior windowsill of a window atop a tall building could easily have a transmitter coverage that would include an *entire* major metropolitan area, even with just the output power of one-half watt ERP. (Antenna height, not transmitter power, is the primary determinant of communications range at these UHF frequencies.)

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9 *R&O* at 18.

Because no device or "apparatus" (in the sense envisioned and specifically prohibited in §95.194(c)) would be physically *attached* to the FRS unit, such an FRS repeater would appear not to be prohibited under the current rules (although its operation would nevertheless clearly violate the *intent* of those rules).

PRSG believes a restriction should be added as §95.193 (f) (FRS Rule 3) to read:

"(f) No FRS unit may retransmit a radio signal from any other FRS unit or from any other radio service."

Without such a restriction, FRS could easily and lawfully be used as an unlicensed repeater of transmissions in *any* radio service.

#### **IV. The Prohibition of Interconnection with the Public Switched (Telephone) Network Should be Expanded.**

The phrase "interconnection with the public switched network" is not sufficiently defined. The GMRS rules also prohibit interconnection,<sup>10</sup> but make certain exceptions for wireline control. In the absence of a more definitive explanation, it is uncertain if these prohibitions in both GMRS and FRS include only the passing audio signals from the telephone network to the radio, or also or instead the passing of audio signals from the radio to the telephone network.

PRSG believes that FRS units should be prohibited from passing audio in *either* direction, and that FRS Rule 3 (§95.193(e)) should be amended to read:

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10 See §95.141.

**“(e) No FRS unit may be interconnected to the public switched network. No FRS unit may transmit any signal carried over the public switched network. No FRS unit may transmit a signal intended to be carried over the public switched network.”**

This rule addition would avoid having to define in greater detail what constitutes “interconnection” in terms of physical attachment or interface. Without this restriction, for example, an FRS unit could retransmit the audio conversation or message from a telephone answering machine, without being physically “interconnected” (in the sense of a hardware interface) with the public switched network.

## **V. FRS Transmitter *and Receiver* Requirements Should Encourage Spectrum Sharing.**

### **A. Transmission Time Should be Limited.**

The operation of an FRS transmitter in a continuous (“key-down”) mode would be inconsistent with the concept of “spectrum sharing.” This can be effectively prohibited by requiring that an FRS unit must employ a transmitter time-out timer. This was discussed by several parties submitting comments to this Docket, and was supported by one manufacturer (Motorola). The formal record contains no indication that this concept was considered. We believe a time-out timer should be required in each FRS transmitter to limit transmission time to not greater than *two minutes*.

We request that §95.629(d) be amended to read:

**“(d) An FRS unit may transmit only emission type F3E, and may transmit for no more than 120 consecutive seconds. A non-voice emission may be used only for selective calling or tone-operated squelch tones to establish voice communications.”**

A prohibition on the use of selective-calling tones for *maintaining* voice communications is discussed in a following section

## **B. Pre-Transmission Monitoring Should Be Required.**

There can be no effective spectrum *sharing* among FRS users (and with licensed GMRS users on the shared channels in the 462 MHz band) unless users monitor *before* transmitting. In addition, there is no way that an FRS user can determine the existence of an emergency communication, to which that user must yield,<sup>11</sup> unless the user monitors for other co-channel communications *during* the communications exchange.

The comparable GMRS rules for pre-transmission monitoring should also be applied to FRS users. They read (47 CFR 95.175):

“The station operator must cooperate in *sharing* each channel with station operators of other stations by:

- (a) Monitoring the channel before initiating transmissions;
- (b) Waiting until ongoing communications are completed before initiating transmissions;
- (c) Engaging in only permissible communications; and
- (d) Limiting transmissions to the minimum practicable time.”

Because the 462 MHz FRS spectrum is shared with licensed GMRS users who employ essentially equivalent radios (the majority of GMRS transmitters are handheld transceivers that radiate a typically one-half to one watt ERP signal), the same pre-transmission-monitoring provisions should apply to both services. We request that the language cited above be added as §95.193(g) to FRS Rule 3.

Furthermore, effective pre-transmission monitoring can be accomplished *only* if any receiver muting or selective-calling protocol is *first disabled* and the receiver is put in an “open squelch” monitoring mode. PRSG has extensive experience with the manner in which GMRS users can

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11 See FRS Rule 3, §95.193(d).

easily circumvent the pre-transmission-monitoring requirement, due to transmitter and equipment design characteristics. (This "failure to monitor before transmitting" is the single most frequent complaint we hear from the GMRS user community about other GMRS users.) We request that §95.637(d) be modified to read:

**"(d) No FRS unit, under any condition of modulation, shall exceed 0.500 W effective radiated power (ERP). No FRS unit shall transmit any power whatsoever if the associated receiver is in a muted mode awaiting receipt of a selective-calling signal. The action of de-muting the FRS radio receiver must be separate and distinct from that of activating the transmitter, and must involve a switch selection that is not *momentary* in nature and that does not require constant operator action or involvement."**

The language of the last sentence above is designed to avoid a problem encountered on some GMRS radios in which the receiver de-muting function is accomplished merely by pressing the transmitter "push-to-talk" (PTT) button itself, or a secondary "push-to-listen" button integral to the normal PTT button. Some GMRS radios have an only *momentary* "push-to-listen" capability. This design ergonomically discourages *meaningful* compliance with the requirement for pre-transmission monitoring.

## **VI. Remote Control By FRS Transmitters Should Be Prohibited.**

Continuous Tone-Controlled Squelch System (CTCSS) and Digital Control System (DCS) protocols are used in GMRS for both remote control (for instance, of repeater transmitters) and for selective calling. The lesson from extensive GMRS experience is that although CTCSS and DCS are excellent and nearly universal choices for remote repeater *control*, the continuous nature of their encoding makes them poor choices for *selective calling*. GMRS users are inclined to leave their radios in a muted condition, defeating or circumventing the pre-transmission monitoring requirements.

Selective calling protocols in FRS should be permitted *only* for the purpose of *establishing* communications, and *not* for the purpose of *sustaining* the communications exchange. To permit otherwise would merely encourage the kind of abuse, through operator failure to revert to open-receiver monitoring, that occurs in the GMRS and in other radio services.

We request that the FRS technical rules be amended to permit the optional use of only those selective-calling protocols which are *temporary* and *non-continuous* in nature, and to prohibit the use of any selective-calling protocols that are *continuous* in nature (including, for instance, CTCSS and DCS). This requires modification of FRS Rule 3 (§95.193(b)) to read as follows:

“(b) The FRS unit may transmit tones to make contact with a particular FRS unit. The tone must last no longer than 5 seconds at one time.”

This language deletes reference to using tones or codes for *maintaining* communications, and eliminates the exemption of tones that are “subaudible.” The current FRS language also fails to recognize that it is not the *audio frequency* (less than 300 Hz) that determines “audibility,” but rather its modulation level relative to that used for the voice communication itself. (A 1 KHz tone at a very low modulation level is much less audible than a 200 Hz tone at a modulation level comparable to that of the voice communication.)

A more specific prohibition against using an FRS unit to remotely control some other hardware or function should be included. It could be added to FRS Rule 3 (§95.193(h)) as:

“(h) You must not use an FRS unit to remotely control any device, except for the purpose of establishing a voice communication permitted under the previous paragraph.”

The language of §95.629(d) should also be modified (as previously described) to eliminate reference to the use of selective-calling or tone-operated squelch tones to *continue* voice communications.

## **VII. Remote Control of FRS Transmitters Should Be Prohibited.**

The issue of FRS repeaters has already been addressed, but the concept of remotely controlling FRS transmitters, or of permitting their untended operation, needs further attention. Clearly the FCC intends that FRS units should be operated by the person wearing or carrying the radio.

“These rules changes create a new personal wireless service that will utilize very low power, convenient-to-carry units capable of transmitting voice communications only over a very short range.”

— R&O at 19.

The implication is that FRS units will be operated by, and will retransmit the *intentional* voice communications of, only the person carrying or wearing the unit. However, the rules as adopted do not (but should) prohibit the uses of FRS units as “baby monitors” or even as surreptitious “bugging devices.”

Although the transmitter timer limits previously discussed would (if adopted) prohibit *continuous* communications, an additional restriction is needed to prohibit the transmission of voice communications not knowingly and willfully *intended* to be transmitted. PRSG requests an additional FRS Rule 3 (§95.193) be added as:

“(i) You must not transmit any voice communications of any person who is not aware that his or her voice is being transmitted. You must not transmit the voice communication of any person who is not wearing or carrying the FRS unit itself.”

## **VIII. FRS Units Must Be Portable and Convenient to Carry.**

Again with reference to the R&O statement at paragraph 19, the implication is that FRS units must be portable. However nominally “portable” radios can be used as *de facto* land stations,

especially if they are permitted to derive their operating power from some source external to the case of the radio itself.

**PRSG requests a second paragraph be added to §95.647 to read as follows:**

**“No FRS unit shall incorporate provisions for being powered from any source other than the battery integral to its case. An FRS unit may employ a connection to an external power supply only for the purpose of charging the internal battery. When connected to such a battery charger, the battery must be disconnected from and unable to supply power to the FRS transmitter.”**

#### **IX. A Copy of the Rules Should Be Supplied with Each FRS Unit.**

Knowledge of and compliance with the rules is unlikely unless the FRS operator has a copy of these rules. This has long been the required practice for Citizens Band Radios at 27 MHz, and should be established for the FRS as well. PRSG requests that a new rule section §95.650 be added as follows:

**“§95.650 Copy of rules.”**

**“A copy of Part 95, Subpart B, of the FCC Rules, current at the time of packing of the transmitter, must be furnished with each FRS unit manufactured.”**

## **X. Certain Technical Standards Pertaining to FRS Operation in the 462 MHz Band Should be Relaxed.**

PRSG supports the technical standards pertaining to FRS transmitter frequency tolerance ( $\pm 0.00025\%$ ),<sup>12</sup> emission bandwidth (12.5 KHz),<sup>13</sup> peak frequency deviation (2.5 KHz)<sup>14</sup> and audio frequency response (3.125 KHz)<sup>15</sup> for FRS units operating in the 467 MHz band. However, we recommend the comparable but less stringent requirements pertaining to GMRS mobile station transmissions for FRS units, when those FRS units operate in the 462 MHz band. PRSG sees no need for tighter FRS standards than those already permitted for GMRS operation on the 462 MHz frequencies shared by both GMRS and FRS operations.

The R&O did not address the issue of GMRS/FRS *inter-service* communications on the 462 MHz frequencies shared by both services. The existing GMRS rules on inter-service sharing are conflicting. For instance, §95.181(i)(14) prohibits GMRS communications with *unauthorized* stations. Similar restrictions are in the “points-of-communications” rules for GMRS mobile stations<sup>16</sup> and base stations.<sup>17</sup> Since FRS units would be *authorized* to use the GMRS 462 MHz interstitial frequencies, these particular rules would seem *not* to prohibit GMRS/FRS inter-service communications.

Other GMRS rules establish *permissible* instead of *prohibited* communications,<sup>18</sup> but fail to mention (and have not yet been proposed to be modified for) GMRS/FRS inter-service communications.

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12 At §95.627(b).

13 At §95.631(c).

14 At §95.635(a).

15 At §95.635(a).

16 At §95.53(e)(4).

17 At §95.55(b)(7).

18 At §95.53(a) for GMRS mobile stations, and at §95.55(a) for base stations

PRSG assumes that such GMRS/FRS inter-service communication is intended, at least for those specific frequencies authorized for use by both services. Indeed, GMRS the pre-transmission monitoring requirement<sup>19</sup> and the requirements in both services to yield to emergency communications<sup>20</sup> presume that operators of radios in both services can hear on-going communications on the same channel in the *other* service. There would therefore seem to be no benefit from establishing different technical performance requirements between the two services, at least with regard to the standards for frequency tolerance, emission bandwidth, peak frequency deviation and audio frequency response.

Some manufacturers may even opt to market FRS units for operation *only* on the 462 MHz FRS frequencies. Such units could be less expensive to manufacturer and market if these relaxed, GMRS-type standards were permitted on the 462 MHz FRS channels. This could be a benefit for those manufacturers uncertain about the demands on and dynamics of this new untested and unlicensed FRS market.

## **XI. FRS Rules Must Recognize the Regulatory and Operational Environments of This Service.**

**The FRS rules do not exist in a vacuum.**

Since the FCC intends to implement the FRS as a form of Citizens Band Radio, the FCC should evaluate the FRS rules in the *regulatory environment* of CB Radio at 27 MHz. FRS users can be expected to make such a comparison. In determining which service (CBRS at 27 MHz, or FRS at 460 MHz) is more appropriate for their needs, FRS users will want to know what is permissible (or what is not *expressly prohibited*) in FRS, compared to what *is* prohibited in CB radio.

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19 At §95.175(a) & (b).

20 At §95.143(a) for GMRS, and at §95.193(d) [FRS Rule 3] for FRS.

Since the FCC intends to authorize the FRS to use certain frequencies also in use by or adjacent to GMRS channels, the FCC should also evaluate the FRS rules in the *spectral and operational environment* of GMRS at 460 MHz. Again, FRS users can be expected to want to know what is permissible in FRS that is *not* permissible in GMRS.

To this end, the FRS rules should be amended by adding the following specific prohibitions:

**“(i) You may not use an FRS station to communicate messages for hire, whether the remuneration received is direct or indirect.”**

This tracks the prohibitions in §95.181(i)(1) for GMRS and §95.414 (CB Rule 14) for CBRS.

**“(j) You may not use an FRS station to communicate false or deceptive messages.”**

This tracks the prohibitions in §95.181(i)(3) for GMRS and §95.413(a)(12) for CBRS.

**“(k) You may not use an FRS station to interfere intentionally with the communication of another FRS or GMRS station. You may not use an FRS station to make any transmission that may have the reasonably anticipated effect of causing the improper or unauthorized operation of any other station.”**

The first sentence tracks the prohibitions in §95.181(i)(5) for GMRS and §95.413(a)(3) for CBRS. The second sentence tracks the intent of §95.173(b)(3). This regulatory protection is for GMRS repeater operators, to prohibit FRS units from being used to harass or to activate GMRS repeaters.

**“(l) You may not use an FRS station to transmit music, whistling, sound effects or any material to amuse or entertain.”**

This tracks the prohibitions in §95.181(i)(6) for GMRS and §95.413(a)(6) for CBRS.

**“(m) You may not use an FRS station to transmit any sound effect only to attract attention.”**

**This tracks the prohibitions in §95.181(i)(7) for GMRS and §95.413(a)(7) for CBRS.**

**“(n) You may not use an FRS station to transmit any message with obscene or indecent words, language or meaning.”**

**This tracks the prohibitions in §95.181(i)(8) for GMRS and §95.413(a)(2) for CBRS, but deletes reference to “profanity.”**

**“(o) You may not use an FRS station to transmit any advertisements or offers for the sale of goods or services ”**

**This tracks the prohibitions in §95.181(i)(9) for GMRS and §95.413(a)(5) for CBRS.**

**“(p) You may not use an FRS station to transmit any advertisements for a political candidate or political campaign. You may use an FRS station for the business or organizational aspects of a campaign if you follow all other applicable rules.”**

**This tracks the prohibitions in §95.181(i)(10) for GMRS and §95.413(a)(10) for CBRS.**

**“(q) You may not use an FRS station to transmit the word “MAYDAY” or any other international distress signal, except when the FRS unit is located on a ship, aircraft or other vehicle which is threatened by grave and imminent danger and you are requesting immediate assistance.”**

**This tracks the prohibitions in §95.181(i)(11) for GMRS and §95.413(a)(8) for CBRS.**

**“(q) You may not use an FRS station to transmit communications intended for live or delayed retransmission by any radio or television broadcast station. Messages about news items or program preparation may be communicated.”**

**This tracks the prohibitions in §95.181(i)(12) for GMRS and §95.413(b) for CBR.**

**“(r) You may not use an FRS station to transmit messages (except emergency messages) to any station in the Amateur Radio Service, to any unauthorized station, or to any foreign station.”**

**This tracks the prohibitions in §95.181(i)(14) for GMRS and §95.413(a)(11) for CBR. It also prohibits an FRS unit from communicating with an *unauthorized* station, such as another FRS unit that is no longer “authorized” because it has been illegally modified, or because in some other way it is being operated in violation of FCC Rules.**

**“(s) You may not use an FRS station to make a continuous or uninterrupted transmission, except for communications involving the immediate safety of life or property.”**

**This tracks the prohibitions in §95.181(i)(15) for GMRS and §95.416 for CBR. Language to incorporate such time restrictions into FRS hardware has previously been discussed.**

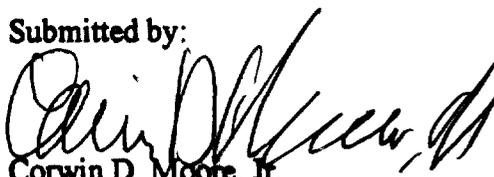
**“(t) You may not use an FRS station to transmit a message intended to be rebroadcast directly by a public address system.”**

**This tracks the prohibitions in §95.181(i)(16) for GMRS.**

**In Conclusion:**

PRSG believes that the FRS Rules can be improved by these changes and additions, and that greater user compliance with the intended use of this spectrum can be achieved by incorporating changes and restrictions into the FRS hardware itself.

Submitted by:



Corwin D. Moore, Jr.

Administrative Coordinator

Personal Radio Steering Group, Inc.