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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

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

In the Matter of)
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GARMIN INTERNATIONAL, INC.)
)
)
Amendment of Sections 95.193(a) and 95.631(d))
to Authorize Manufacture, Sale and Use of GPS)
Transmission Enhanced FRS Units)
)
)
Amendment of Section 95.193 (a), 95.193 (b),)
and 95.631(d) of the Commission's Rules)
Governing Permissible Communications in)
the Family Radio Service)

RM No. _____

To the Commission:

PETITION FOR RULE MAKING

Garmin International, Inc. ("Garmin"), pursuant to Section 1.401(a) of the Commission's rules, by its attorneys, hereby petitions the Commission to amend certain provisions of its Part 95 Personal Radio Service rules relating to the Family Radio Service ("FRS"). These amendments are necessary to authorize the manufacture, sale and use of enhanced FRS devices capable of transmitting and receiving a brief data burst containing Global Positioning System ("GPS") location information on FRS channels. The proposed amendments will serve the public interest by providing a highly desirable and important service that furthers the purposes for which the FRS was created.¹

1. See generally *In the Matter of Garmin International, Inc. Request for Waiver of FRS Sections 95.193(a) and 95.631(d) to Authorize Manufacture, Sale and Use of GPS Transmission of Enhanced FRS Units*, DA 00-2234, September 28, 2000 ("Waiver Order") at ¶ 7.

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Specifically, Garmin seeks to amend Sections 95.193(a), 95.193(b), and 95.631(d) of the Commission's FRS rules to authorize digital data transmission of GPS location information on FRS enhanced radios operating on FRS frequencies. Garmin proposes that these transmissions be limited as follows: (1) transmissions may not exceed one second in duration; (2) transmissions can occur no more than once every ten seconds; and, (3) transmissions must be initiated by a manual key press. Amendment of the FRS rules as proposed by Garmin will greatly enhance the FRS by providing a simple means for transmitting accurate and critical location information on FRS channels. The instantaneous transmission of accurate location information would help to protect the safety of lives and property, and provide additional safety and security. All of these goals can be achieved while maintaining the integrity of the FRS rules and staying within the purposes for which the FRS was created.

I. BACKGROUND

1. Garmin is an industry leader in GPS technology and an innovator in consumer electronics for marine, aviation, automotive and recreational markets. In order for the general public to benefit from this expertise, Garmin would like to manufacture and market inexpensive, handheld GPS enhanced FRS transceivers capable of both transmitting GPS location information on FRS frequencies and graphically displaying the GPS location information on a receiving radio.² This

2. GPS is a satellite-based navigation and positioning system consisting of a constellation of 28 orbiting satellites. The satellites and their ground control and monitoring stations are maintained and operated by the United States Department of Defense. The satellites have worldwide coverage and the Department of Defense does not charge users for access to the satellite signals.

By receiving radio signals from four or more satellites, a GPS receiver can calculate its
(continued...)

GPS transmission enhancement would allow an FRS user to transmit his or her location to other FRS users by pressing a button on the unit which transmits a digital data burst on an FRS channel, lasting *less than one second*, containing location information. The transmission is received by a Garmin GPS-enhanced FRS unit which will display the location information. In all other respects, the GPS-enhanced FRS unit will function similar to any other FRS unit (*i.e.*, a “push to talk” radio unit).

2. On September 28, 2000, the Commission granted Garmin a waiver of §§95.193(a) and (b) and 95.631(d) to conduct a one-year trial of its enhanced FRS transceivers.³ In the Waiver Order, the Commission found the Garmin proposal to be in the public interest, and the Commission invited Garmin to file a Petition for Rule Making for permanent authorization to manufacture and market the proposed enhanced FRS radio units.⁴

2. (...continued)
position in three dimensions-- latitude, longitude and altitude-- and can also calculate the speed at which the receiver is moving, the direction in which the receiver is moving and the precise time of day.

The satellites continuously transmit precisely timed radio signals using extremely accurate atomic clocks. A GPS receiver calculates distances from the satellites in view by determining the travel time of a coded signal from the satellite to the receiver. The receiver then triangulates its position using its known distance from each satellite and calculates latitude, longitude and altitude. The satellites also provide highly accurate timing information which can be displayed by a GPS receiver in the form of the time of day.

Prior to May 2000, the U.S. Department of Defense intentionally degraded the accuracy of civilian GPS signals in a process known as Selective Availability ("SA"). SA variably degraded GPS position accuracy to a radius of 100 meters. On May 2, 2000, the U.S. Department of Defense turned off SA. With SA removed, a GPS receiver can calculate its position to an accuracy of 10 meters or less. The removal of SA has significantly enhanced the utility of GPS and has significantly enhanced the benefits of a GPS-enhanced FRS transceiver.

3. Waiver Order ¶ 7.

4. *Id.* at n.32. On October 29, 2000, Garmin petitioned for reconsideration of the one-year time
(continued...)

II. AMENDING THE RULES AS PROPOSED WILL SERVE THE PUBLIC INTEREST

3. In 1996, the Commission established the FRS to fill a niche market in short distance, personal communications needs.⁵ The Commission envisioned that the FRS would provide an affordable and convenient means of direct, short-range, two-way voice communications among small groups of persons, with minimal regulation.⁶ The Commission recognized the public safety benefits of FRS units when it stated that:

the FRS would enhance public and personal safety and service to individuals, including individuals with disabilities and parents wanting to keep in touch with their children . . . Many families and other small groups have need for their members to communicate with each other while visiting shopping malls and amusement parks, attending sporting events, camping or when taking part in recreational and other activities.”⁷

The FRS rules are intended to ensure that the FRS is used to meet the needs of families and other small groups for direct, short range, two-way voice communications, particularly when persons

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4. (...continued)
limit arguing that one year did not provide sufficient time to design, manufacture and market the enhanced FRS transceiver. Garmin requested that the waiver be granted for an additional year. This request is currently pending before the Commission.
5. *Amendment of Part 95 of the Commission’s Rules to Establish a Very Short Distance Two-way Radio Service*, Report and Order, WT Docket No. 95-102, 11 FCC Rcd 12977 (1996) (“FRS Report and Order”).
6. *Id.* at 12978 ¶ 2.
7. *Id.* at 12979 ¶ 5. The FRS Report and Order also noted that creation of the FRS would “encourage the rapid deployment of new telecommunications technologies,” consistent with the Telecommunications Act of 1996. *Id.* ¶ 19. The coupling of FRS and GPS technology created by Garmin is exactly the type of technological innovation that the Commission envisioned.

become separated, either planned or inadvertently.⁸ In addition, the FRS rules provide for one-way emergency messages, thereby facilitating the safety of family or group members who have become inadvertently separated.⁹

4. Adding the GPS capability to FRS radio units provides a significant enhancement to a service that the Commission has already categorized as one that “would enhance public and personal safety and service to individuals, including individuals with disabilities and parents wanting to keep in touch with their children.”¹⁰ Locating lost family members or members of groups in the woods, or in amusement parks, for example, can be performed with great precision through the transmission of GPS data that can then be reproduced graphically on the receiving FRS unit.¹¹ This is especially true now that President Clinton has announced that the intentional degradation of the

8. FRS Report and Order at 12978 ¶ 3.

9. See 47 C.F.R. §95.193(a).

10. *Amendment of Part 95 of the Commission’s Rules to Establish a Very Short Distance Two-way Radio Service*, Notice of Proposed Rule Making, WT Docket No. 95-102, 10 FCC Rcd 8235 (1995). A good example of how GPS technology could have improved FRS radio units can be found in a June 21, 2000 story in *The Oregonian*, a copy of which is attached as Exhibit A. To summarize, two hikers were at the 8,000 foot level on Mount Hood in Oregon, when they were hit by a rock avalanche at 7:30 a.m. They signaled for help several times throughout the day until two young brothers, 70-miles away and in the woods using their FRS radios, heard the distress call of one of the hikers at 1:00 p.m. The authorities were notified and the hikers were finally rescued at 4:45 p.m. While two young boys with their FRS radios units were praised in this story for saving the lives of two hikers, the search and rescue could have been much more efficient and quicker had the enhanced FRS radio units been available to the hikers; their location could have been pinpointed and decisions concerning rescue alternatives could have been made much more rapidly and efficiently.

11. It should be noted that the Commission recently adopted rules which will require cellular radiotelephone handsets to provide location information in emergencies through either GPS or network-based technology. See *Revision of the Commission’s Rules To Ensure Compatibility With Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, Third Report and Order, 14 FCC Rcd 17388 (1999).

accuracy of the GPS system known as “Selective Availability” (“SA”) would end effective May 1, 2000.¹² This means that GPS-derived location information transmitted by an FRS radio will now be accurate to within 10 meters or less. President Clinton stated that “this increase in accuracy will allow new GPS applications to emerge and continue to enhance the lives of people around the world.”¹³

5. The enhancement of the FRS as proposed herein is the direct result of technological development in equipment and services that have occurred since the creation of the FRS. Technological developments, availability of requisite equipment at a reasonable price, and the removal of SA now make it possible to provide a low cost, handheld device to the public capable of transmitting and graphically displaying critical location information. Accordingly, amending the rules as proposed herein will further the purpose for which the FRS was created.¹⁴

6. The enhancements to the FRS units proposed by the rule amendments will not result in a departure from the original underlying purposes of the FRS, nor are they likely to cause interference to any other users in the band. As discussed above, the proposed amendments fall squarely within the original purposes for which the FRS was created. Furthermore, because of the safeguards of permitting only a one second or less data transmission, and limiting the data transmission to no more than once every ten seconds, it is not likely that these transmissions will lead to interference problems. It should be noted that § 95.193(b) of the rules already authorizes

12. See Statement by the President Regarding the United States Decision to Stop Degrading Global Positioning System Accuracy,” Office of the Press Secretary, The White House, released May 1, 2000.

13. *Id.*

14. See Waiver Order ¶ 7.

certain non-voice communications, including an audible analog tone lasting up to 15 seconds. Accordingly, Garmin's proposal for a less than one second data transmission will not increase the probability of interference or increase spectrum congestion.

7. The current FRS rules provide for voice-type emissions only by specifying F3E emissions at § 95.63(d) of the rules.¹⁵ Garmin is proposing the addition of an F2D emission to authorize the transmission of GPS position information as digital data (which transmission will last less than one second). Garmin proposes to keep the digital transmission within the same bandwidth as a voice modulated transmission to avoid radio frequency interference with other channels. In addition, Garmin will use currently authorized subaudible squelch tones to identify the FRS radio from which the GPS information is being sent. This tone will only be audible to other FRS radios on the same channel employing the same squelch tone and to FRS radios on the same channel employing only a noise squelch. Because Garmin will employ 38 squelch tones and the 14 FRS channels, the likelihood of the digital transmission causing interference to other users operating FRS radios equipped with subaudible squelch tones is, at most, negligible. In the unlikely event that the digital transmission were to cause interference because the same squelch tone and channel were being used by nearby users, such interference would be less than one second and the transmission would either not be noticeable, or would amount to a mere blip of static on a voice channel. Interference to users operating FRS radios equipped with only noise squelch is also unlikely to occur since 14 channels are available.

8. The proposed rule amendments would, in fact, create additional spectrum efficiency by transmitting critical and accurate location data with a very brief transmission. The proposed

15. The rules do provide, however, for non-voice emissions for selective calling or tone operated squelch tones to establish or continue voice communications. 47 C.F.R. § 95.631(d).

amendments are, therefore, consistent with the FRS Report and Order which states that the Commission’s “primary objectives in setting technical standards are to ensure (1) that FRS units do not cause interference to other services and (2) that large numbers of users can share the same channels in the same or adjoining neighborhoods or other areas.”¹⁶

III. PROPOSED RULE AMENDMENTS

9. Section 95.193(a) of the Commission’s rules currently states that “[y]ou may use an FRS unit to conduct two-way voice communications with another person. You may use the FRS unit to transmit one-way communications only to establish communications with another person, send an emergency message, provide traveler assistance, make a voice page or to conduct a brief test.”¹⁷ Garmin proposes that this rule section be amended to provide for “non-voice” communications, as follows (proposed amendments are underlined and in **boldface type**):

95.193(a) You may use an FRS unit to conduct two-way voice communications with another person. You may use the FRS unit to transmit one-way voice or non-voice communications only to establish communications with another person, send an emergency message, provide traveler assistance, **provide location information**, make a voice page or to conduct a brief test.

10. Section 95.193(b) currently states: “[t]he FRS unit may transmit tones to make contact or to continue communications with a particular FRS unit. If the tone is audible (more than 300 Hertz), it must last no longer than 15 seconds at one time. If the tone is subaudible (300 Hertz

16. FRS Report and Order at 12982 ¶ 13.

17. 47 C.F.R. §95.193(a).

or less), it may be transmitted continuously only while you are talking.”¹⁸ Garmin proposes that this rule provision be amended as follows:

95.193(b) The FRS unit may transmit tones to make contact or to continue communications with a particular FRS unit. If the tone is audible (more than 300 Hertz), it must last no longer than 15 seconds at one time. If the tone is subaudible (300 Hertz or less), it may be transmitted continuously only while you are talking. **The FRS unit may transmit digital data containing location information. Digital data transmission: (i) shall not exceed one second, (ii) must be initiated by a manual key press, and (iii) shall be limited to no more than one digital transmission every ten seconds.**

11. Section 95.631(d) states: “An FRS unit may transmit only emission type F3E. A non-voice emission is limited to selective calling or tone-operated squelch tones to establish or continue voice communications.”¹⁹ Garmin suggests that this rule section be amended as follows:

95.631(d) An FRS unit may transmit only emission type F3E **or F2D.** A non-voice emission is limited to selective calling, tone-operated squelch tones to establish or continue voice communications, **or digital data transmission of location information.**

IV. CONCLUSION

For the reasons set forth above, Garmin respectfully requests the Commission to amend Sections 95.193(a) and (b) and Section 95.631(d) of the rules, as suggested herein, to provide for the

18. 47 C.F.R. §95.193(b).

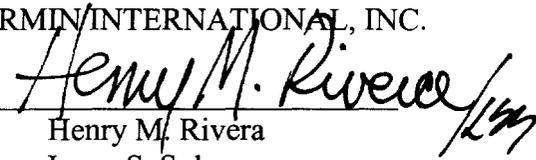
19. 47 C.F.R. §95.631(d).

transmission of technologically-advanced communications critical to the safety of life and property
in the Family Radio Service.

Respectfully submitted,

GARMIN INTERNATIONAL, INC.

By:



Henry M. Rivera

Larry S. Solomon

Tamara Y. Brown

SHOOK, HARDY & BACON, LLP

600 14th Street, N.W.

Suite 800

Washington, D.C. 20005

(202) 783-8400

ITS ATTORNEYS

Andrew R. Etkind, Esquire
General Counsel
GARMIN International, Inc.
1200 E. 151st Street
Olathe, KS 66062
(913) 397-8200

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EXHIBIT A

From: Larry Solomon

PORTLAND METRO WEST

Boy, 7, saves lives of 2 injured
climbers on Mount Hood

Wednesday, June 21, 2000

By Stuart Tomlinson of The Oregonian staff

A young boy near McMinnville carrying a walkie-talkie with a two-mile range picked up the faint signal Tuesday morning of two climbers 70 miles away on Mount Hood making a plea for help on their two-way radios after being hit by a rockfall.

Both men were listed in fair condition Tuesday evening at Legacy Emanuel Hospital. Jim Clark, 38, had a hip injury and Iain Morris, 23, a hand injury. Their hometowns were unavailable.

Fletcher Wold, 7, and his brother, Parker, 5, heard the distress call about 1 p.m. as they scampered around a hilltop on their rural property.

"It was kind of scratchy," Fletcher said. "The man said he was on Mount Hood and he was hurt."

The boys got the \$80 Radio Shack radios from their father, Mike Wold, as Christmas gifts last year. "They're always off in the woods roaming around," Wold said Tuesday, "and we got them to keep in touch. I keep one, and they keep the other."

When he heard the plea, Fletcher called his dad on the radio, but Wold was in a log out-building with a metal roof that blocked the radio's signal. Fletcher ran and found him.

Wold took the radio. He heard a voice say "My name is Jim Clark. We've been hit by a rock avalanche. I'm injured. I can't walk." The man then said he was at about the 8,000-foot level on the mountain's northwest side along with a second climber who was hurt. The rocks hit them about 7:30 a.m.

Search officials said the two men were ascending the mountain by the Sandy Glacier Headwall route, which takes a direct line up the west face of the approximately 11,240-foot peak. Officials said the route has little foot traffic, especially on a weekday.

"I was surprised nobody else had heard them all that time," Wold said. "I guess it all has to do with line of sight -- we're high on a hill with a great view of the mountain."

Sales of the so-called personal communicators have become increasingly popular with hikers, sportsman and families who want to stay in touch in the woods, Radio Shack officials said. The walkie-talkies use a license-free frequency band for the Family Radio Service, newly created by the Federal Communications Commission.

Clackamas County Deputy Chris Nolte said that from high up Mount Hood, with no obstructions, the signal from the climber's radio could go even farther than McMinnville. But it was Fletcher reacting correctly that made the difference.

"If it wasn't for Fletcher, they might still be up there waiting for help," Deputy Angela Blanchard said. "He saved their lives."

At first the sheriff's office considered a land-based rescue. Two members of American Medical Response's Reach & Treat team based in Sandy were dispatched to the mountain via Lolo Pass Road, the main road to access several trailheads on the mountain's northwest side, but AMR spokeswoman Luana Hill said the climbers were where a ground rescue would take five to six hours.

"The hip injury was serious enough to prevent the one climber from walking out," Blanchard said. "It was a life-threatening injury."

At 4:15 p.m., an Air Force Reserve rescue helicopter from the 939th Rescue Wing's 304th Rescue Squadron flew to the mountain. Karole Scott, spokeswoman for the Portland-based unit, said the six-person crew aboard hovered over the injured climbers by 4:45 p.m.

Staff Sgt. Dean Dilday was the first to reach the men. He said Morris had managed to drag Clark about 1,000 feet down the mountain on a tarp, putting them out of harm's way from more rockfall.

Clark was in great pain, and both were exhausted, Dilday said.

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