RM - 10074

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Before the

Federal Communications Commission

Washington, D. C. 20554

In the Matter of:)

Informal request for Commission Action:)

Motion to Rescind DA-00-2234, a Waiver)

authorizing Garmin International, Inc. to) ~~DA-00-2234~~

produce FRS units that incorporate GPS)

transmission capability.)

To the Commission: **INFORMAL REQUEST FOR COMMISSION ACTION:**

MOTION TO RESCIND WAIVER

This motion to rescind the waiver granted to Garmin International, Inc. is because it does not serve the best interests of the public. Specifically, the waiver, as currently constructed, fails to provide any meaningful enhancement to the "Family Radio Service" (FRS). The public interest and necessity that would warrant a waiver, such as for public safety (which has such great potential for this application), are absent. It does not serve the public interest to continue with this flawed approach when much better, compatible solutions exist.

THE PUBLIC INTEREST AND NECESSITY

To fill the role of public interest and necessity, the product should provide a useful function to warrant a modification or waiver of the rules. Sometimes changing the intent and purpose of the service is necessary. However, here, that is not entirely so ! While the rules require a definite modification to achieve the desired result, the Commission can easily preserve the original intent of the service while providing a worthwhile **safety** enhancement.

THE INTENT

The intent of the FRS service is to provide localized short range communications for "families and other small groups." FRS is an unlicenced service, with no guarantee as to the competency of the person using the service. Typically those lost are children or young people that do not always think like clear headed adults, especially under stress. Even adults under stress do not think clearly, especially if injured.

If properly applied, Garmin's idea would enhance FRS, ensuring a measure of safety for and without regard as to the competency of the operator. Automation of this idea serves the public benefit because it spans all levels of competency and age, requiring no intervention by the user.

Mere supposition of a safety application, as enumerated in the waiver, does not pass any standards of objectivity and the methods subscribed do not provide any degree of safety. The intent of this motion is to explore the methods and solutions available that provide the best application of Garmin's idea in serving the public interest and necessity.

THE PROBLEM

Garmin International, Inc. originally presented a valid enhancement to the FRS service. Garmin's intent appeared to fit the public interest by providing a safety feature. The Commission largely rejected Garmin's efforts until they resubmitted this partially granted waiver. Applying a narrow view, the Commission only served to relegate the usefulness of this enhancement to that of a mere **toy,** providing no safety at all. A "micro management" approach by the Commission does little to encourage new technology that benefits the public. While the Commission does have the responsibility to manage and protect the public interest, it often does so by taking a constricted approach to new ideas.

The Commission was further remiss in not specifying the methods and standards with respect to the data transmission itself. Codification of the waiver in its present form would

result in the manufacturers pursuing their own data format. Only units of the same manufacturer would be guaranteed to work together. This does not serve the public's interest !

A clear and definable set of standards need to be in place so that manufacturers will provide compatible equipment. This is a required necessity to make the safety aspect of an enhancement a viable function. Additional consultation by the Commission with their engineering staff would prove useful.

Including a GPS unit within a radio has enormous implications when it comes to providing assistance in time of **REAL** need. However, the safety aspect goes out the window when it requires the operator to push a button every **10** seconds. If a **REAL** need for assistance exists, the possibility of the operator being **UNABLE** to push the button is **VERY HIGH**. The normal means and use of the FRS units are voice communications. If a party could push a button every **10** seconds to activate the GPS function, it also means that the party could press the "Push To Talk" (PTT) button and use **VOICE**. So the DA-00-2234 authorized enhancement does little for safety under normal conditions except to provide a gadget to play with. That is a toy!

A REASONABLE UTILITY

Incorporation of the GPS with the FRS is a very desirable utility. Such a marriage would make the FRS service an extremely viable tool regarding public safety. If utilized, it would give a definite edge to Search and Rescue Teams that spend time and enormous resources when called to duty.

A practical application of this technology would be at the numerous National and State Parks around the country. The park systems have limited budgets and personnel. They rely on volunteer Search and Rescue Teams. If they required hikers to carry FRS/GPS units, then Search and Rescue Teams could quickly pinpoint their locations, saving valuable time and lives. Some parks with trail systems require hikers to check in and out at ranger stations. Unfortunately, no one covers the area between.

Other examples that would entail Search and Rescue operations are mountain climbing, hunting, canoe/kayak/rafting trips on inland waterways, and horseback riding facilities, to name a few. Also, educational groups on outings could benefit by having an inexpensive means of providing safety for the children involved. Usually these outings have limited adult supervision. This would be another valuable tool available to those supervising such outings.

On the home front, it could, indeed, allow family members to more easily determine each others' locations. This could prove useful during large public gatherings like parades, county fairs and similar activities.

A SYSTEM OF STANDARDS AND THE AX.25/APRS PROTOCOL

A GPS function similar to Garmin's proposal has been in wide use by Amateur Radio Operators and others since 1992. The AX.25 and APRS (Automatic Position Reporting System) protocols are recognized standards throughout the world, not just in the United States. APRS is a defined and focused specification of how the AX.25 data protocol is used for transmitting GPS data. An APRS system uses a radio, an AX.25 modem and a GPS unit. The Amateur Radio Service already has fully integrated position reporting capability in several Amateur Radio units currently on the market. These units can receive APRS data without a GPS unit. With a data signal from a GPS unit, they will transmit APRS position and other information. Reference Kenwood's (http://www.kenwood.net/) TM-D700 mobile radio, TH-D7AG walkie-talkie, and Alinco's (http://www.alinco.com/usa.html) DR-135TP mobile unit. This is essentially what Garmin is proposing to do in the FRS service.

The originator of APRS is Mr. Bob Bruninga (Amateur Radio call sign WB4APR), and his Internet site on this matter is available at the following URL: http://web.usna.navy.mil/~bruninga/aprs.html. The Amateurs have linked APRS systems on HF, VHF and UHF, including being presented on the Internet in real time. One excellent Internet site displaying this activity is available at the following URL: http://www.aprs.net/.

As the premier independent organization, Tucson Amateur Packet Radio (TAPR) serves

as the primary focal point and forum for digital concepts within the worldwide Amateur Radio community. They, and a small group in Canada, are the ones that **pioneered** the AX.25 data protocol for radio transmission in the latter part of the 1970's. The worldwide Internet uses the X.25 data protocol. They have derived AX.25 data protocol from X.25. The difference is in the application with radio transmissions. Besides Amateur Radio, many worldwide commercial applications use the AX.25 protocol.

As with any complex system, precise specifications are required to define the standards of that system to maintain compatibility across many platforms. Applying GPS to the FRS service requires the same standards. TAPR is recognized worldwide as the standard's committee for AX.25 and APRS. The Commission should also acknowledge TAPR and require the AX.25 protocol as the standard in implementing GPS over FRS. General information and technical specifications for both AX.25 and APRS are available on the TAPR web site at: http://www.tapr.org/. To gain useful insight, the Commission should review this information.

MULTI USE RADIO SERVICE (MURS), AN ALTERNATIVE

"The Multi-Use Radio Service (MURS) – a private, two-way, short-distance voice, data or image communications service for personal or business activities of the general public." This service requires no license, permits a higher power level and could accomplish the interlinking sought by Garmin without alteration of the FRS service.

However, differences between FRS and MURS exist, making MURS less desirable. Only five channels are available for MURS. These channels are, and have been, in heavy use by the popular "color dot" radios and others. Additional uses of MURS will develop, most likely, using various forms of data transmission.

If left unchecked, the existing ability to transmit continuous data on MURS could overshadow other uses, rendering this service usable to only a few in any given locale. The Commission should consider specifying only the AX.25 protocol, preventing future problems. The AX.25 protocol will transmit data including text, binary files, picture formats, and slow scan

video.

The Commission could entertain adding a sixth (6th) channel to the MURS service with only "UNRESTRICTED AX.25 PROTOCOL" permitted. This would serve FRS and others that need the same protocol. For example, a growing industry does weather measurements on a local basis. These systems usually have many such stations covering a given area. The purpose is to provide better weather prediction for farmers and growers on a real time basis. Such systems are currently employed in the greater San Joaquin Valley in California. Weather stations currently in place use phone lines. With MURS, favorable placement could be realized, allowing better weather predictions. Permitting "UNRESTRICTED AX.25 PROTOCOL" on one channel would limit the activity, to something reasonable, permitting satisfaction for everyone using it.

This would serve Garmin's intentions, the public interest and preserve the intent of FRS. Current technology would easily permit the inclusion of a "transmit/receive" function on MURS frequencies, along with the FRS circuitry. Many examples of this are available in the Amateur Radio service, where "walkie-talkies" covering up to four spectrum ranges are available.

THE REQUIRED ENGINEERING

The matter of the 10-second BUTTON is not a workable process. What would work for FRS/GPS is APRS. Observing the screen action at the URL: http://www.aprs.net/ will show that many stations are on the air, in any given location, on a common frequency, with little or no problems. FRS can accomplish this and not need a 10-second BUTTON. The GPS part of FRS/GPS should be automatic, allowing for an incapacitated operator. Further, GPS transmissions should be on their own frequency using the APRS protocol. With the introduction of MURS, several additional approaches to solving the Garmin pursuit are available.

Transmitting on any FRS channel, as stated in the waiver, does not provide safety because of not knowing when or where to listen. Permitting data transmission only on one channel would correct this. If a voice channel is selected, then the AX.25/APRS "PTT" mode is

available. This mode transmits the data burst immediately after releasing the PTT button. The data bursts are shorter, as equipment delays are minimal.

The drawback to this method (the PTT mode) is that it does not allow for the incapacitation of the operator. Allowing continuous data bursts on any, or even one of the fourteen voice channels is also untenable because it could interfere with voice activity. What is more important, is not knowing which channel to listen on for safety purposes.

A more desirable method would be to provide a fifteenth (15^{th}) FRS channel whose sole purpose is for the AX.25 GPS data burst. This would alleviate interference on the normal fourteen voice channels, allow for automatic GPS activity and permit the required level of safety to be achieved.

As previously described there are five channels for MURS use. For safety, only one MURS channel should be specified. The desirable direction would be to add a sixth (6^{th}) channel to MURS, permitting only AX.25/APRS transmissions, for the same reasons stated above.

Another issue not addressed by the waiver is identifying the sender with respect to the GPS signal. As many such signals may be present, the specified signal would only show on the screen as an unidentified spot. To correct this, an identifying mark would have to be transmitted. This could take three forms: adding a user modifiable identifier; or a preassigned identifier that is unmodifiable by the user, or both.

From a safety point of view, a mark added by the user would not necessarily be unique. A preassigned unmodifiable identifier would solve this problem. Both methods are preferable, can be easily realized and should be implemented.

The cell phone industry has a similar circumstance. They have preassigned non modifiable electronic serial numbers and the user ID called a phone number. FRS/GPS could employ a similar process, except the user ID could be regular letters and numbers. This would then preserve the uniqueness required for safety reasons. AX.25/APRS protocols already provide for this.

THE EQUIPMENT

The FRS/GPS unit should have a dual receiving system, permitting simultaneous reception of voice and GPS data. This technology is inexpensive and routinely available in Amateur Radio transceivers. Using FRS frequencies, the transmitter can share its function between voice and data without any problems.

As previously discussed, the key to FRS/GPS functionality is not the radio equipment, but the data format. Utilizing a universally recognized standard would provide the basis for interoperability between manufacturers.

THE REGULATORY CONCERN

The Commission's concern, as expressed in DA-00-2234, is a matter of application in using the FRS/GPS for location purposes. Differentiation between personal use and commercial applications is the main issue. While perhaps valid, not giving appropriate consideration to the safety aspect has misdirected the Commission in its approach.

As stated in DA-00-2234, page 4, paragraph 7, sentence 2, the intent of FRS is to meet the needs of "families and other small groups" for short range two-way radio communications. Nothing prevents commercial entities from using the FRS service. Information available shows this to be true. Types of businesses finding FRS usable are shopping malls, swap meet locations, stores, warehouses, construction sites, amusement parks, ranches, farms, campus school systems, boating marinas and golf courses, to name a few.

So, what is to be said regarding FRS/GPS locating use ? None of the mentioned entities need such activities. GPS has three specific primary areas of use: Surveying, Navigation, and Tracking.

Of the two examples presented in DA-00-2234, the surveying example fails because the required accuracy is not obtainable in such an easy manner. It requires much more than a

simple GPS receiver that, at best, is only accurate to 15 feet. Surveyors require centimeter accuracy (way less than one foot). Surveyors achieve this with much computing power and special GPS receivers with enhancements. Equipment of this nature costs thousands of dollars.

GPS navigation is a visual aspect requiring much computational activity. This mode of operation has no bearing on the transmitted data with respect to FRS. This is not information that would serve any purpose for transmission, and, therefore, is not an issue.

The other example is general purpose tracking. Commercial companies provide this service for a fee on frequencies already designated for their use. The primary concern is using FRS to circumvent the commercial industry.

Nice idea, but short on range among other things ! This is just not going to happen on the scale that the Commission visualizes. Some reasons are outlined below:

1) The FRS power level is too low and does not provide the range necessary for any large commercially feasible systems;

2) Interference protection would not exist on FRS or MURS as it does on the frequencies allocated for such purposes;

3) The manufacturers can modify the speed factors of the GPS internal firmware rendering the FRS/GPS useless to normal vehicle tracking, giving an added measure of protection to the commercial systems;

4) Economies of scale would not be practical in implementing a wide area system using FRS/GPS for **normal** tracking purposes.

The expense of commercial tracking systems would not be justified when the area, scope, and use are small. Also, the commercial tracking companies are only attempting to serve very large markets such as Los Angeles, California. The commercial companies do not provide service to those locations where a person would most likely be lost. The FRS/GPS tracking uses would generally fit within the guidelines and purposes of safety.

CONCLUSION

The GPS enhancement is highly desirable and would serve the public interest and necessity very well. As explained, two services are available with several options. These are summed up as follows:

1. Using only FRS frequencies, the following choices exist:
   a. As the current waiver suggests, pushing a button;
   b. Using the PTT AX.25/APRS mode, sending data at the end of a voice transmission;
   c. Same as "a" but only on a specified channel;
   d. Same as "b" but only on a specified channel;
   e. Create a 15th channel allowing for automatic AX.25/APRS operation (recommended).
2. Incorporating MURS, the following choices exist:
   a. Rules already allow such operation on any MURS frequency;
   b. Specify that only one of the 5 channels be used (suggested);
   c. Create a 6th channel allowing only AX.25/APRS automatic operation (recommended).

The MURS process provides for the greatest benefit with the least interruption to the FRS rules and regulations.

With safety being the primary concern and guiding factor, maximizing available resources is an important goal. First, selecting an appropriate standard with a proven track record is highly desirable. Second, specifying an appropriate independent organization to support and maintain this standard makes sense. Third, choosing a known standard that already exists with a large reserve of trained operators for search and rescue is ideal.

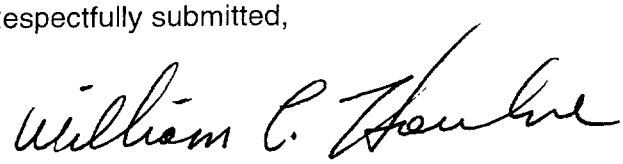
One of the largest resources of equipment and personnel is the Amateur Radio community. The AX.25/APRS protocol system has been in use by Amateur Radio operators for many years. Much of the Amateur equipment can already receive on the FRS and MURS frequencies. A major purpose of Amateur Radio is to provide a reserve of trained operators for emergencies. (Refer to 47CFR97.1(d) of the Amateur Radio rules). Amateur Radio operators

are heavily involved in Search and Rescue functions around the country and proudly provide their time to the benefit of the public. It would make good sense to use AX.25/APRS protocol for the basis of the FRS/GPS.

Additionally, even if the FRS/GPS function is retained on the FRS frequencies, the AX.25 protocol should be implemented on the MURS frequencies. This would prevent up coming issues and provide the same stability that is addressed here for FRS.

To correct the course of events thus far, the Commission should rescind the letter of waiver, document DA-00-2234. Please find that the substance of this motion conforms to the public interest and necessity, and calls for resolving Garmin's request to the benefit of the public.

Respectfully submitted,



William C. Houlne
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February 26, 2001

Pursuant to my understanding of the Exparte Rules, I have mailed a copy to:

Andrew R. Etkind, Esquire
General Counsel
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