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April 10, 2003

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VIA EXPERIMENTAL RADIO ELECTRONIC FILING SYSTEM

Mr. Doug Young
Experimental Radio Branch
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

Re: Your Correspondence Reference 2537
File No. 0113-EX-ST-2003

Dear Mr. Young:

This is in response to your message of April 8, 2003.

Radiated Power. The 60 watt ERP is the power that will be radiated into a roll of paper weighing as much as five tons, not the power that is to be radiated into free space. As Exhibit 1 to the application notes, the power radiated into free space will be less than one watt ERP. Moreover, the operation is to occur at an industrial complex (i.e. a paper mill), which is an inherently noisy radio environment because of the presence of electrical equipment and associated controls. Nevertheless, if the power limit for experimentation were specified as "one watt ERP radiated into free space," that would be acceptable. As Exhibit 1 to the application explains, the system design is such that it will not even function at the 60 watt level radiated into free space.

The application proposed 60 watts because of the need to experiment with various power levels in order to confirm the reliability of the system. In this context, please note that the maximum ERP for the Location and Monitoring Service in this band is 30 watts. Before a system of this kind is approved under the equipment authorization program and licensed under Part 90, its reliability at an ERP of 30 watts must be established. The use of a maximum of 60 watts ERP directed into the paper roll from an antenna in contact with the roll will allow for experimentation at a level that is 3 dB above the maximum LMS ERP. The concept is that one would test at 30 watts and determine the reliability. If it appears sufficient, then that is really the end of that portion of the experiment. If it does not prove sufficiently reliable, the additional 3 dB will allow for some increase to then determine how much overall system gain must be achieved elsewhere. It is much more expeditious to determine first the additional amount of system gain in this fashion and then work out improvements in the system to achieve the added reliability at 30 watts than it is

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to make incremental changes in other aspects of the system without first knowing how much additional gain is required. Hence, the 60 watt ERP level was proposed. If the 60 watt level is an absolute impediment to the issuance of the STA, the experiment could be conducted at 30 watts ERP radiated into the roll of paper, but this may prolong the testing.

Location and Monitoring Service. The equipment being developed is for a use that is fully consistent with the non-multilateration LMS requirements. While Section 90.351 provides that LMS systems utilize non-voice radio techniques to determine the location and status of mobile radio units, its important to recognize that the rules distinguish between multilateration systems and non-multilateration systems. The experimentation to be conducted under the STA will involve a non-multilateration system. Section 90.7 of the Rules defines a non-multilateration LMS system as “a system that employs any of a number of non-multilateration technologies to transmit information to and/or from vehicular units.” Thus, the key aspect of non-multilateration system operation is that the information move to and/or from “vehicular units.” In adopting the LMS rules, the Commission made clear that LMS non-multilateration techniques had to be used to determine information and location relating to vehicles.¹

The non-multilateration rules, for example would not support locating a person walking into an area or determining whether an otherwise stationary vending machine had been moved, but the rules do contemplate a myriad of uses involving many different kinds of vehicles as diverse as automobiles (*e.g.* in so-called toll tag systems), trains on tracks, cranes and gantries used to move cargo on and off ships, and conveyors that move assemblies through manufacturing plants. While neither the rules nor the Commission decisions implementing the rules define the term *vehicle*, the commonly accepted dictionary definition provides that a vehicle is “a device or structure for transporting persons or things; a conveyance...”²

In this case, the LMS technology will be used to determine the precise location of a clamp truck loader with respect to a particular roll of paper, much like a toll-tag non-multilateration system is used to locate an automobile with respect to a particular lane at a specified toll plaza. The clamp truck is similar to a forklift truck and is clearly a vehicle. The LMS technology will also be used to locate a large tray carrying a particular roll of paper as the tray moves on a conveyor through the paper

¹ Location and Monitoring Service, Report and Order, 10 FCC Rcd 4695 (Para 24) (1995).

² The American Heritage College Dictionary, Third Ed., Houghton Mifflin Co., p. 1495 (1993).

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mill, much like LMS is used to track the movement of automobile chassis carried by a conveyor through a manufacturing plant. The conveyor with the trays that ride on it is also a vehicle. Notably, these analogous examples have long been licensed in the non-multilateration LMS. As such, the application for tracking vehicles used in and around paper mills will be very much in keeping with both the letter and spirit of the LMS rules.

Please contact me if you have any further questions.

Sincerely,

David E. Hilliard

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