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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

October 26, 2000

**BY HAND DELIVERY**

Ms. Magalie Salas, Secretary  
Federal Communications Commission  
445 12th Street SW, Room TW-B204  
Washington DC 20554

**RE: MPH Industries, Inc., FCC ID CJR-SWS-K15  
Request for Waiver of Section 15.205(b) of the Commission's Rules**

Dear Ms. Salas:

Pursuant to Section 1.3 of the Commission's Rules, I am writing on behalf of Safety Warning Systems, L.C. (SWS) to request a waiver of Section 15.205(b).

This request concerns the above-referenced pending application for certification of a device (Device) filed by MPH Industries, Inc. MPH licenses the technology in the Device from SWS, and asked SWS to file this request on its behalf.

The Device is a Part 15 intentional radiator that transmits data at 24.1 GHz, pursuant to Section 15.249. Its sole purpose is to send traffic safety alerts to a receiver in a moving car. Messages can include information on road hazards, accidents, construction, emergency vehicles, slow-moving equipment, oversize loads, and the like.

This request concerns only the issue of the appropriate limit for the second and third harmonics of the Device.

Sec. 15.249(a) lists the fundamental and harmonic limits for a 24 GHz Part 15 transmitter, such as this one. That rule allows harmonics at a field strength of 2500 uV/m at 3m. The Device complies with this limit.

The Office of Engineering and Technology (OET), however, has determined that the governing rule is Sec. 15.205(b). That provision limits the spurious emissions in a restricted band to the values in Sec. 15.209. As discussed below, all harmonics of a 24 GHz device fall into a restricted band. The applicable Sec. 15.209 limit is 500  $\mu\text{V}/\text{m}$  at 3m. Because the second and third harmonics of the Device exceed that value, OET deems it to be out of compliance.

For the reasons set out below, SWS requests a waiver of Sec. 15.205 to permit certification of the Device.

**A. Establishment of the Restricted Band Above 40 GHz Was Based on a Now-Obsolete Assumption.**

The Sec. 15.209 limit comes into play only because Sec. 15.205 identifies the entire spectrum above 38.6 GHz as a restricted band. All the harmonics of a 24.1 GHz device therefore fall in a restricted band.

The present listing of restricted bands arose in the 1989 overhaul of Part 15.<sup>1</sup> The over-38.6 band specified in Sec. 15.205(a) is actually two distinct bands. First, the Commission listed 38.6-40 GHz to protect an allocation for satellite downlinks. Second, the Commission separately established a blanket restricted listing for all frequencies above 40 GHz. But the Commission did **not** take this step because all frequencies above 40 GHz need protection. Instead, the blanket listing above 40 GHz was simply a matter of administrative convenience, to avoid the need for individual decisions on dozens of different allocations. At the time the rule was promulgated, no Part 15 device required measurements above 40 GHz, so the blanket listing did not disadvantage anyone.-

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<sup>1</sup> Revision of Part 15 of the Rules, 4 FCC Rcd 3493, paras 61-74 & pages 3550-3553 (Appendix C) (1989). A few more restricted bands have been added since.

<sup>2</sup> The Commission explained the restricted band above 40 GHz in these terms:

Numerous bands above 40 GHz would be restricted because of their allocation for radio astronomy, satellite down links, etc. **In addition, the rules limit the range of measurements to 40 GHz. Because measurements are not required above 40 GHz, standards have not been established at higher frequencies.** Further, there appears to be no current demand for non-licensed operation above 40 GHz. Thus, operation of a Part 15 device above 40 GHz is not being permitted at this time. Specific restricted frequency bands and standards for Part 15 devices operating above 40 GHz will be addressed in a future rule making proceeding, if needed.

Revision of Part 15 of the Rules, 4 FCC Rcd at 3553 (emphasis added).

That changed in 1995, with a rulemaking that required intentional radiators whose fundamental frequencies are at or above 10 GHz to be measured above 40 GHz.<sup>3</sup> A 24 GHz transmitter must now be studied to 100 GHz. Thus, the 1989 assumption that “measurements are not required above 40 GHz”<sup>4</sup> has ceased to be true. Although the 1989 order promised a rulemaking to reexamine the restricted bands above 40 GHz “if needed.” that rulemaking has not yet occurred. Accordingly, the blanket restricted band above 40 GHz relies expressly on a former measurement ceiling that the Commission has since removed. The primary rationale for the blanket restricted band has expired.

The over-40 restricted band thus creates a burden that was unanticipated at the time the band was established. The Commission can, however, avoid the unintentional burden by granting the requested waiver.

**B. Services Allocated to the Second and Third Harmonics of a 24.1 GHz Transmitter Do Not Need the Protection of a Restricted Band.**

The second harmonic of a 24.1 GHz transmitter falls at 48.2 GHz, and the third harmonic at 72.3 GHz. The following table shows the U.S. allocations for these frequencies.<sup>6</sup> (Note that 48.2 GHz lies is at the boundary between two allocations.)

	U.S. Gov’t	Non-Gov’t
<b>47.2-48.2 GHz</b>	<i>(none)</i>	FIXED; FIXED-SATELLITE (Earth-to-space); MOBILE
<b>48.2-50.2 GHz</b>	FIXED; FIXED-SATELLITE (Earth-to-space); MOBILE	FIXED. FIXED-SATELLITE (Earth-to-space); MOBILE
<b>71-74 GHz</b>	FIXED; FIXED-SATELLITE (Earth-to-space); MOBILE; MOBILE-SATELLITE (Earth-to-space)	<i>(none)</i>

None of these services routinely receives restricted-band protection under Sec. 15.205. The Commission has said, “[O]nly those frequency bands allocated for services involving safety-of-life or for services that are required by the nature of their operation to

<sup>3</sup> Use of Radio Frequencies Above 40 GHz for New Radio Applications, 11 FCC Rcd 448 1 (1995), **codified at 47** C.F.R. Sec. 15.33(a).

<sup>4</sup> Revision of Part 15 of the Rules, 4 FCC Rcd at 3553.

<sup>5</sup> *id.*

<sup>6</sup> 47 C.F.R. Sec. 2.106.

use signals received at very low received levels should be designated as restricted bands.” Typical protected services include radio astronomy, radionavigation and other aeronautical services. distress frequencies. search and rescue, and satellite downlink.” None of these is involved here. When the Commission ultimately reexamines and updates the over-40 restricted band, it will almost certainly remove the bands in the table above from restricted status.’ In the meantime. the Commission can grant the requested waiver with full confidence its action will not cause interference to any service entitled to protection.

**C. The Second and Third Harmonics of the Device Are So Weak as to Be Immeasurable at 3 Meters.**

The measurement report included with the original certification application shows (at page 10) that measurements of the second and third harmonics were taken at 1 m and 25cm respectively, rather than the rated distance of 3m. Close-in measurements were necessary because the signal was too weak to be measured with a standard spectrum analyzer set-up at the rated distance of 3m. A signal level too low to register on standard test equipment cannot pose any realistic threat of interference to other users of the spectrum.

**D. Rapid Deployment of the Device in Question Is in the Public Interest.**

The sole purpose of the Device is to warn motorists of traffic hazards and other adverse highway conditions in real time -- in time to avoid accidents. The receiver alerts the driver via an audible alarm, LED text message, and/or synthesized voice. The transmitter -- the Device at issue here -- functions in a stationary capacity. A transmitter may be permanently installed in a high-accident area, programmed to send a continuous signal alerting motorists to potential danger. Temporary transmitters can be placed in construction zones and moved along with the work site. A bridge prone to icing can be fitted with a transmitter equipped to send an alert while the temperature remains below a preset value.

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Revision of Part 15 of the Rules, 4 FCC Rcd at 3503 para. 66.

<sup>8</sup> See *id.*, 4 FCC Rcd at 3550-53.

<sup>9</sup> Footnotes US342 and US270 request special protection for radio astronomy at 48.94-49.04 and 72.77-72.91 GHz, respectively. The Device does not produce harmonic energy in either band.

The effective range of the device is approximately 1,000 feet -- more than adequate warning when placed ahead of the special condition or hazard in question. even at Interstate speeds. A simple software change to the transmitter, done remotely. changes the text of more than 60 pre-programmed messages. Five categories of messages cover warnings for highway construction or maintenance zones, weather-related hazards, highway hazard advisories. travel and convenience information, and fast/slow moving vehicles.

The Commission has acknowledged the value of this technology: “We believe that the SWS [system] will increase traffic safety by providing local governments and public safety eligibles with a new, technologically advanced, and economical means for alerting motorists to hazardous driving conditions.”

The U.S. Congress and Department of Transportation (DOT) agree. Two years ago. DOT announced it had earmarked funds for further study of the SWS system. and announced also that it would administer grants to state and local governments to purchase the equipment and study its efficacy. These actions followed the President’s signing of the Transportation Equity Act of the 21st Century on June 9, 1998. The Act included \$2.1 million for research and grants relating to the SWS system over the next three years.

In short, the SWS system promises to reduce accidents and save lives. It is unquestionably in the public interest.

**E. This Request Meets the Applicable Legal Standards for a Waiver.**

The U.S. Court of Appeals for the D.C. Circuit has held,

[A] general rule, deemed valid because its overall objectives are in the public interest, may not be in the “public interest” if extended to an applicant who proposes a new service that will not undermine the policy, served by the rule, that has been adjudged in the public interest.<sup>11</sup>

The conditions set out by the court as mandating consideration of a waiver are thoroughly met here. Grant of the requested waiver will increase the availability of a technology that gives state and local governments the means to improve traffic safety in their jurisdictions at low cost. That is plainly in the public interest. Yet the grant poses no threat to the Commission’s policy objectives of limiting harmful interference from unlicensed devices. The harmonic emissions at issue are at very low power, and fall in a restricted band only because the Commission took the shortcut many years ago of declaring all frequencies above 40 GHz to be restricted. The harmonics do not affect an allocation that is ordinarily entitled to restricted status.

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<sup>10</sup> Private Land Mobile Radio, 4 FCC Rcd 3023 at para. 12 (1999).

<sup>11</sup> WAIT Radio v. FCC, 418 F.2d 1153, 1157 (D.C. Cir. 1969).

Accordingly, the waiver is in the public interest, and is amply entitled to the “hard look” mandated by WAIT Radio.<sup>12</sup>

### CONCLUSION

Sec. 15.249 sets limits for the harmonics of intentional radiators in the 24-24.25 GHz band. The Device complies with those limits.

Rather than apply those limits, however, the Commission reasons that the harmonics of a 24 GHz device fall in a restricted band, and therefore may not exceed the very stringent limits in Sec. 15.209. The Device exceeds those limits at the second and third harmonics.

SWS requests a waiver to permit certification of the Device under the limits in Sec. 15.249 for the second and third harmonics.

- Sec. 15.209 applies only because the harmonics fall in a restricted band. That happens only because a 1989 Commission ruling adopted the expedient of declaring all frequencies above 40 GHz to be restricted. The Commission justified that decision by noting that no measurements were required above 40 GHz. Now that such measurements are required, the blanket restricted band over 40 GHz places an unanticipated burden on manufacturers, with no corresponding benefit to the public.
- None of the bands affected by the second and third harmonics of the Device is allocated to a service that would qualify for a restricted band.
- The emissions at the second and third harmonics are immeasurable a few meters away, and cannot realistically be a source of actual interference to any user.
- Rapid deployment of the Device is in the public interest, because it promotes traffic safety, without threat of interference.
- This request meets the applicable legal standards for a waiver established under WAIT Radio v. FCC.

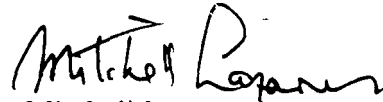
For each of these reasons, the Commission should grant the requested waiver.

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<sup>12</sup> *Id.*, 418 F.2d at 1157 (“[A]llegations such as those made by petitioners, stated with clarity and accompanied by supporting data, are not subject to perfunctory treatment, but must be given a ‘hard look.’”)

Please do not hesitate to call or email if there are any questions about this request.

Respectfully submitted.



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