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OCT - 6 2006
Federal Communications Commission
Office of the Secretary

October 6, 2006

BY HAND DELIVERY
Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Dear Ms. Dortch:

On July 28, 2006, UltraVision Security Systems, Inc., filed a "Request for Interpretation and Waiver." This submission has not appeared on public notice.

UltraVision moves to withdraw that request and to replace it with the attached.

Please call with any questions.

Respectfully submitted,

Mitchell Lazarus
Counsel for UltraVision Security Systems, Inc.

ML:deb

cc: Courtesy Service List

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OCT - 6 2006

Federal Communications Commission
Office of the Secretary

Before the
Federal Communications Commission
Washington DC 20554

In the Matter of	)	
	)	
UltraVision Security Systems, Inc.,	)	File No. _____
Request for Interpretation and Waiver of	)	
Section 15.511 of the Commission's Rules	)	

REQUEST FOR INTERPRETATION AND WAIVER

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October 6, 2006

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Before the
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In the Matter of	)	
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Request for Interpretation and Waiver of	)	
Section 15.511 of the Commission's Rules	)	

REQUEST FOR INTERPRETATION AND WAIVER

A. Summary

Applicant UltraVision Security Systems, Inc. is a wholly-owned subsidiary of Geophysical Survey Systems, Inc., a pioneer in ultra-wideband (UWB) ground-penetrating radar (GPR), with several Commission GPR certifications.

UltraVision has adapted GPR UWB technology to develop "UltraSensor™," a UWB surveillance system that can significantly improve life safety, commercial security, and national security.[1] UltraSensor is ideal for protecting homeland security and critical infrastructure installations such as nuclear power plants, government offices, cellular towers, harbor facilities, airports, and pipeline pumping stations, in addition to high-value commercial sites.

UltraSensor devices are buried under pavement or lawn around the site to be protected. They are invisible to intruders, tamper-proof, and require no maintenance.

UltraSensor tracks the location, velocity, and mass of an intruder. It can be programmed to ignore birds and dogs, for example, and respond only to pedestrians and vehicles, or to respond only to vehicles above a certain size or speed. This important feature eliminates the

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[1] UltraVision holds a patent for UWB in security applications.

multiple false alarms that plague other surveillance technologies, freeing security personnel to concentrate on the real threats. The sensor is compatible with existing IP-enabled security systems.

We file this request because UltraSensor does not comply with the Commission's UWB rules. That, however, is largely an artifact of the regulatory process. When the Commission adopted UWB rules in 2002, it departed from the usual Part 15 approach, which sets emissions limits and leaves manufacturers free to develop any product within those constraints. The Commission instead organized the UWB rules around eight very specific categories of equipment in predetermined parts of the spectrum.[2] These were the products known to the Commission at that time. But UltraSensor technology had not been invented in 2002, and consequently is missing from the rules.

We show below that UltraSensor is less interfering than the authorized categories of UWB devices. **UltraSensor emissions are below the most restrictive limits anywhere in the UWB rules.**[3] UltraSensor also offers improved security over every other surveillance technology available. If the UWB proceeding took place today, UltraSensor would almost certainly be included.

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[2] The categories are ground penetrating radars, wall imaging systems, through-wall imaging systems, surveillance systems, medical imaging systems, vehicular radar systems, indoor UWB systems, and hand held UWB systems. *See* 47 C.F.R. Secs. 15.509-15.519.

[3] All UWB devices must comply with Section 15.209 limits at frequencies below 960 MHz, and with more stringent limits in the GPS bands. In addition, every category of device is permitted relatively high emissions levels (–41.3 dBm) in some range of frequencies above 960 MHz. UltraSensor complies with Section 15.209 below 960 MHz, and with the GPS limits, but has no appreciable emissions anywhere above 960 MHz. Its emissions do not approach –41.3 dBm at any frequency.

We request a rule interpretation that UltraSensor qualifies as a UWB surveillance system. Although UltraSensor squarely fits the definition of surveillance system, it arguably does not comply with the technical rules -- ironically, because it has less interference potential than surveillance systems that do comply. UWB surveillance systems must have their operating bandwidth between 1990 and 10,600 MHz.[4] But UltraSensor needs no emissions at all in that band, and fully complies everywhere else in the spectrum. UltraSensor gets by with what the Commission regards as low-level spurious emissions, and meets the limits for those emissions.

The marketing rules for surveillance systems limit sales to emergency responders, manufacturers, and petroleum and power companies. Missing from this list are certain users that badly need improved security technology, such as airports, harbor facilities, telecommunications sites, and others. To accommodate these, and in view of UltraSensor's low likelihood of interference, we also request a waiver to permit sales to any commercial, governmental, or non-profit entity, but excluding residential installations.

UltraSensor is always at a fixed location, permitting precise and reliable coordination with other users. And, because UltraSensor is installed below ground level, its signal cannot propagate far. For these reasons, in combination with low emissions from the device, authorizing sales of UltraSensor to a wider range of users does not create an appreciable threat of interference.

UltraVision proposes several waiver conditions that will further limit the likelihood of interference, and also provide for swift identification of the source, in the unlikely event that harmful interference were to occur.

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[4] 47 C.F.R. Sec. 15.511(a).

After considering all relevant factors, the Commission can properly conclude that UltraSensor presents no more interference risk than compliant UWB surveillance systems, and offers superior abilities to enhance security. On balance, the public interest strongly favors a grant of the interpretation and waiver requested here.

Request for bifurcation. If the Commission adopts different procedures for the rule interpretation and the waiver (such as public notice and comment for one but not the other), then UltraVision requests that the two be bifurcated and processed separately, so as to bring improved technology more quickly to at least some entities needing advanced security systems.

B. Description of the UltraSensor Device

UltraSensor units are buried 15-20 cm underground, below pavement or turf, about every 20 meters around the site to be protected (such as a building, power plant, or pipeline facility). The units radiate a low-power UWB signal. A collocated receiver analyzes the return signal for the presence, location, velocity, and mass of an intruder. CCTV security cameras can be wired into the system so they orient automatically to an intrusion.

Examples of likely UltraSensor applications include –

High security perimeter:

- nuclear plants
- harbor facilities
- defense contractors
- government offices
- transportation centers

Remote facility alarm:

- telephone switching offices
- power substations
- cellular towers
- pipeline pumping stations
- seasonal facilities

Commercial perimeter:

- new vehicle storage lots
- high-value warehouses
- financial institutions
- airport parking lots.

Technical description: UltraSensor is a UWB device whose –10 dB bandwidth typically lies between 80 and 600 MHz, and always below 700 MHz. The device complies with Section 15.209 at all frequencies below (and also above) 900 MHz, and complies with GPS limits. Emissions above 900 MHz are negligible.

The UWB pulses are 2 nsec wide at 20-80 kHz. The worst-case duty cycle is 2 nsec/12.5 μsec = 1/6,250. Pulses are dithered, all but eliminating the possibility of nearby units emitting simultaneously.

Operational description. Compared to other surveillance technologies, UltraSensor offers the following advantages:[5]

- concealed operation, invisible to an intruder;
- tamper proof, hidden where an intruder cannot disable it;
- operates in all weather conditions (and is weatherproof);
- requires little or no maintenance;

---

[5] See also Part F, below.

- provides target information not available from other systems:
  - *real-time distance to moving target (such as pedestrian or vehicle),*
  - real-time velocity of target,
  - target mass;
- readings on target velocity and mass allow automatic classification of target -- *e.g.*, vehicle, person, small animal, object blown by the wind.

These properties add up to a smarter sensor -- one that is much more reliable, and with a much lower rate of false alarms, than any other system on the market. Where false alarms are frequent in other outdoor systems and create a major distraction for security forces, UltraSensor helps personnel to focus on the threats that matter.

C. Basis for This Request

The UWB rules adopted in 2002 authorize specific applications operating in particular frequency bands.[6] Those applications reflect the technologies known to the Commission during the rulemaking. Many manufacturers came forward to make sure the Commission was aware of their technical requirements and to argue the public interest in their products.[7] And indeed, the Commission was able to authorize most of the product categories extant at that time. But the UltraSensor technology was not yet in development in 2002. Accordingly, the rules make no provision for a UWB surveillance system operating below 960 MHz.

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[6] *See generally* 47 C.F.R. Secs. 15.509-15.519.

[7] Geophysical Survey Systems, Inc., a GPR manufacturer and corporate parent of UltraVision Security Systems, took part in the UWB proceeding both in its own name and as a member of the Ground Penetrating Radar Industry Coalition. Its presentations dealt only with GPRs.

A reasonable interpretation of the rules nevertheless will find UltraSensor in compliance with Section 15.511, on UWB surveillance systems. UltraVision further requests a minor waiver of Section 15.511 -- an expansion of the marketing rules to include categories of users not anticipated in the rulemaking. The waiver is justified because UltraSensor has less potential for interference than the surveillance systems contemplated under the rules. Proposed waiver conditions will further limit interference and, if necessary, help in identifying the source of any that occurs.

D. The Commission Should Certify UltraSensor as a Surveillance System Under Section 15.511.

The Commission's Rules define a surveillance system as:

> [a] field disturbance sensor used to establish a stationary RF perimeter field that is used for security purposes to detect the intrusion of persons or objects.[8]

UltraSensor fits squarely within this definition.

The technical rules for surveillance systems provide:

> (a) The UWB bandwidth of an imaging system operating under the provisions of this section must be contained between 1990 MHz and 10,600 MHz.
>
> [. . .]
>
> (c) The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in Sec. 15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits . . . .[9]

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[8] 47 C.F.R. Sec. 15.503(j).

[9] 47 C.F.R. Sec. 15.511 (a), (c) (emissions limits omitted above 960 MHz).

UltraSensor complies with paragraph (c), immediately above. As noted earlier, the emissions above 900 MHz are negligible, far below the stated limits, while emissions below 900 MHz comply in full with Section 15.209.

UltraSensor does not comply with the terms of paragraph (a), having virtually no emissions between 1990 MHz and 10,600 MHz. But that should not be a disqualification. **UltraSensor fails to satisfy the rule only because it is quieter and less interfering than a compliant Section 15.511 device.** UltraSensor does its job using fully compliant emissions below 900 MHz. It simply does not need emissions above 1990 MHz. Putting this another way, UltraSensor could be made compliant by adding signal above 1990 MHz. But that would only increase the interference risk. **UltraSensor should not be penalized for accomplishing its function with lower emissions than are contemplated under the rules.**

To be sure, a conventional UWB surveillance system -- one having its operating band above 1990 MHz -- might emit less energy below 960 MHz than UltraSensor does. But that should not affect the outcome. UltraSensor complies in full with the emissions limits below (and above) 960 MHz, which is all that the rules require.

Consider, for example, a compliant UWB surveillance system having the same emissions below 960 MHz as UltraSensor does and, in addition, producing energy above 1990 MHz at the much higher level of –41.3 dBm. This device is unquestionably entitled to certification, even with wideband emissions below 960 MHz, inasmuch as it complies with the rules in all respects. But UltraSensor is the same as that device, and also complies in all respects -- except that it produces much less energy above 960 MHz. To deny it certification for that reason alone would be irrational.

In any event, the UltraSensor emissions below 960 MHz -- in fact, below 700 MHz -- are trivial, just a few nanowatts. The energy into the passband of an actual receiver at any realistic distance will be completely undetectable.[10]

The Commission once before addressed the problem of a device disqualified for having too-low emissions, although in that instance the frequency bands were reversed from those here. The original GPR rules adopted in 2002 required the UWB bandwidth to lie below 960 MHz.[11] In a petition for reconsideration, a trade group argued in favor of authorizing GPRs that have low emissions below 960 MHz. In the Commission's words,

> a product can be shown to comply with the requirement to contain the –10 dB bandwidth below 960 MHz simply by adding noise to the emissions below 960 MHz, thereby increasing the potential interference to radio services below 960 MHz, even though the transmitter actually would be operating above 960 MHz.[12]

The Commission responded by allowing GPRs to operate at any frequency below 10.6 GHz, within applicable emissions limits.[13]

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[10] UltraSensor emissions are comparable to, or less than, those from a GPR that operates below 960 MHz. Operation of those devices has not caused any reported interference. UltraSensor presents even less of a hazard than GPRs because its locations are fixed and subject to precise coordination.

[11] 47 C.F.R. Sec. 15.509(a) (2002) (low frequency imaging systems). As a prctical matter, the rules on mid- and high frequency imaging systems excluded most GPRs. 47 C.F.R. Secs. 15.511(b), 15.513(b) (2002). The Commission subsequently reorganized the rules around types of devices, rather than frequency bands. *Ultra-Wideband Transmission Systems*, 18 FCC Rcd 3857 at Appendix B (2003).

[12] *Ultra-Wideband Transmission Systems*, 18 FCC Rcd 3857 at para. 21 (2003).

[13] *Id.* at para. 35.

Similarly here, energy above 1990 MHz is needed only for compliance, not for successful operation. For the Commission to insist that a device be potentially more interfering in order to qualify under the rules is emphatically not in the public interest.

UltraVision thus requests an interpretation that its UltraSensor device complies with Section 15.511 as a surveillance system.

E. The Commission Should Waive the Marketing Rules Under Section 15.511.

The operation of UWB surveillance systems is limited to

> law enforcement, fire or emergency rescue organizations or by manufacturers licensees, petroleum licensees or power licensees as defined in Sec. 90.7 of this chapter.[14]

The latter three categories -- manufacturer, power, and petroleum licensees -- are broadly defined.[15] But they nonetheless omit potential UltraSensor applications that are unmistakably in the public interest, and that raise no greater threat of interference than those enumerated in the rule. Examples include harbor facilities, government offices, high-value warehouses, financial institutions, telephone switching offices, and others.[16]

The Commission has acknowledged that a surveillance system, being fixed in a permanent location, can use coordination to prevent interference.[17] As detailed below,

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[14] 47 C.F.R. Sec. 15.511(b).

[15] 47 C.F.R. Sec. 90.7.

[16] See Part B, above.

[17] "Surveillance systems will operate only at fixed locations such that harmful interference can be avoided through coordination. In addition, if harmful interference were to occur the source can be readily identified and corrected." *Ultra-Wideband Transmission Systems*, 17 FCC Rcd 7435 at para. 55 (2002).

UltraVision proposes to maintain a complete database of exact locations of devices authorized under the waiver, and will make those data available to the Commission and to NTIA on request. Needless to say, UltraVision will honor its obligation to promptly correct any reported harmful interference, by shutting off the unit if necessary.[18]

UltraVision asks the Commission to expand Section 15.511(b) to allow installation of the UltraSensor device on the premises of any party eligible for licensing under Part 90 of the Commission's Rules. This will not increase the risk of interference beyond that under Section 15.511(b). Indeed, because UltraSensor is less interfering than compliant UWB surveillance systems, the combination of rule interpretation and waiver will yield installations that are both less interfering and more broadly in the public interest than compliant systems.

F. Public Interest in the UltraSensor Device

UltraSensor uniquely avoids certain shortcomings common to most other surveillance technologies. This is not marketing hype. UltraSensor provides more reliable security for locations such as governmental and critical infrastructure sites than is otherwise possible.[19]

Competing surveillance technologies suffer from susceptibility to frequent false alarms. Although able to detect a moving object in the field of view, they often fail to distinguish between a truck and a piece of paper in the wind. The result is a barrage of false alarms. A signal representing a real intruder, buried in the clamor, is likely to be overlooked.

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[18] *See* 47 C.F.R. Sec. 15.5(c).

[19] Supporting this point is the naming of UltraSensor as "Best New Product in 2006" for intruder detection at the ISC West security show. The selection was made by a panel of security industry experts.

Alternatively, if the operator turns down the sensitivity to eliminate most of the false alarms, there is a good chance of missing the events the system was installed to detect.

UltraSensor, in contrast, is uniquely able to track the location, velocity, and mass of an object. It can distinguish a vehicle from a person, and a person from a dog. The incidence of false alarms is low. Real intrusion events are identified as such, so that security personnel can respond appropriately.

Other types of surveillance system entail some form of exterior "lens" -- an optical lens, an ultrasonic transducer, or some form of radio antenna. These generally require cleaning or other maintenance. Worse, they betray not only the presence of a surveillance system, but also the technology used, and sometimes the extent and type of coverage. A sophisticated intruder may be able to use this information to bypass or defeat the system. In contrast, the UltraSensor device is buried underground where it is invisible and tamper-proof.

Other surveillance systems are affected to various degrees by the weather. UltraSensor is not.

At a time when both governments and private companies serving the public are more concerned than ever about securing their facilities against potential wrong-doers, it makes no sense to lock out a valuable technology. UltraSensor's sole regulatory shortcoming is its non-compliance with rules written for other categories of equipment. We ask the Commission to weigh the enhanced security that UltraSensor offers against its negligible interference potential, and to conclude that its deployment is in the public interest.

G. Legal Issues

The Commission assesses waiver requests according to the standards set out in *WAIT Radio v. FCC*.[20] In that case, as here, the applicant sought to operate in contravention of the rules while explaining how it would nonetheless accomplish the purpose of the rules.[21] The court required the Commission to consider the request:

> [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.[22]

The plain meaning is clear: Waiver is appropriate where the applicant furthers the public interest inherent in the underlying rule. UltraVision does so here. It will fully achieve the purpose of the UWB rules in limiting interference, as detailed above. Moreover, UltraVision will further the public interest by providing improved security to governmental and critical infrastructure facilities. The requested waiver fits easily into the boundaries drawn by *WAIT Radio*.

The Court of Appeals emphasized the importance of waiver procedures as part of the regulatory scheme:

> The agency's discretion to proceed in difficult areas through general rules is intimately linked to the existence of a safety valve procedure for

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[20] 418 F.2d 1153 (D.C. Cir. 1969). *E.g., 2002 Biennial Regulatory Review*, 18 FCC Rcd 13620 at para. 85 n.130 (2003) (citing *WAIT Radio* as "setting out criteria for waivers of Commission rules.")

[21] WAIT Radio operated an AM broadcast station. It was limited to daylight hours so as to afford protection to "white areas" that had no local service, and that relied on nighttime skywave propagation from another station. WAIT Radio proposed to transmit at night using a directional antenna that would limit its signal in the white areas. *WAIT Radio v. FCC*, 418 F.2d at 1154-55.

[22] *WAIT Radio v. FCC*, 418 F.2d at 1157.

> consideration of an application for exemption based on special circumstances.[23]

Thus, it said, "allegations such as those made by petitioners, stated with clarity and accompanied by supporting data . . . must be given a 'hard look.'"[24]

Here, too, the request fully qualifies. The "safety valve" of the waiver procedure is needed to make available an important tool for security at critical facilities. The requested waiver is in the public interest, not only in terms of benefits to the public, but also in the absence of any likely increase in harmful interference. The request is entitled not only to the "hard look" mandated in *WAIT Radio,* but to a grant of the waiver.

H. Proposed Waiver Conditions

UltraVision proposes the following conditions on a grant of the requested waiver:

- Waivered devices must be permanently installed at fixed locations.
- UltraVision must keep up-to-date records of the exact locations of all waivered installations, and must share that information with the Commission and with other agencies of the U.S. Government on request.
- Sales of waivered devices to consumers are prohibited.
- Installation of waivered devices must be carried out only by licensed security companies.
- Customers must be informed of UltraVision's obligation to avoid causing harmful interference and to correct any harmful interference that occurs.
- Operation must cease if harmful interference cannot be corrected.

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23 *Id.*

24 *Id.* (citation footnote omitted).

I. Request for Bifurcation

The Commission may adopt different procedures for the rule interpretation (that UltraSensor qualifies as a surveillance system) and the waiver (to allow broader marketing) that could result in the two progressing at different rates of speed. For example, the Commission might decide that the waiver, but not the interpretation, requires public notice and comment. In that event, UltraVision requests that the interpretation and waiver be bifurcated and processed separately, so that entities within the present marketing rule can benefit from UltraSensor technology while the Commission considers whether to expand the eligible group.

CONCLUSION

UltraSensor brings new security benefits to governmental and critical infrastructure facilities -- low rates of false alarms, high reliability, low maintenance, tamper-proof installation, and accurate threat identification. At the same time, UltraSensor is less interfering than other UWB imaging technologies authorized under the Commission's Rules, and is more amenable to precise, location-based coordination. A grant of the requested waiver is in the public interest.

Respectfully submitted,

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703-812-0440
Counsel for UltraVision Security Systems, Inc.

October 6, 2006

TECHNICAL CERTIFICATION

I am a technically qualified person who reviewed the foregoing Request for Interpretation and Waiver.

I certify that the technical statements therein are correct to the best of my knowledge.

Dennis J. Johnson
President
UltraVision Security Systems, Inc.

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