

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

In the Matter of)	
)	
RECONROBOTICS, INC.)	WP Docket 08-63
)	
Request for Waiver of Part 90 of the Commission's Rules for a Video and Audio Surveillance System at 430-450 MHz)	

**To: The Chief, Wireless Telecommunications Bureau; and
The Chief, Public Safety and Homeland Security Bureau
Via the OFFICE OF THE SECRETARY**

**COMMENTS OF ARRL, THE NATIONAL ASSOCIATION
FOR AMATEUR RADIO**

ARRL, the national association for Amateur Radio (ARRL), by counsel and pursuant to the Public Notice, DA 08-1077, released May 6, 2008, hereby respectfully submits its comments in response to the *Request for Waiver* filed originally on or about January 11, 2008 by ReconRobotics, Inc. (Petitioner) Petitioner claims to have developed a portable, analog, robotic surveillance and data transmission system permitting video and audio surveillance in hazardous areas, called the "Recon Scout." The device allegedly provides audio and video and other sensing circuitry, and would be used for law enforcement and firefighting efforts. The device is presently configured by the manufacturer to operate in the 420-450 MHz band, at 1 watt peak power. Because it operates on a channelized basis, each of the three channels being six megahertz wide, the necessary bandwidth of the device is apparently close to 6 MHz. Petitioner asks that it be granted an unspecified series of permanent waivers to allow the marketing and sale to, and use of this device by law enforcement and fire department personnel for public safety

applications. In the interests of the Amateur Service, which has a heavily occupied, secondary allocation in the 420-450 MHz band, and which would be potentially substantially impacted by grant of these waivers, ARRL states as follows:

1. Petitioner asks for unspecified permanent waivers of Part 90 rules in order to market and sell thousands of units of the “Recon Scout” device, and for its customers to use the device at unpredictable locations, both during training and actual deployment. In fact, it would appear that it is not merely Part 90 service rules that would have to be waived in order to market, sell and utilize the device. Though the Waiver Request is not a model of specificity, it seems to propose licensed use of this device. It refers to “certification and limited licensing” to certain Part 90 Public Safety eligibles. The technical standards for certification of this device under the Commission’s equipment authorization program are not specified in any rules anywhere, however. This is because, contrary to Petitioner’s claim, *there is no domestic allocation for Public Safety land mobile services in the 430-450 MHz band.*¹ Because the three channels on which the device is proposed to operate in this band² are all within that segment, what is being requested is not only a waiver of Part 90 service rules, but also a waiver of Section 2.106 of the Commission’s Rules, the table of allocations. The only allocations in the 430-450 MHz band are for Government Radiolocation (limited to military radars) and on a secondary basis, the Amateur Service. Per Section 90.273 of the Commission’s rules, frequencies above 429.99375 MHz and below 450 MHz are unavailable to stations in the land mobile service anywhere in the United States.

¹ There is, at Section 90.103(c) an allocation for non-government Part 90 *radiolocation*, but that is limited to NON emissions only, and there is no mobile allocation in the band at all.

² The three channels incorporated in the device are 430-436 MHz, 436-442 MHz, and 442-448 MHz.

2. The Commission would be well-advised to refrain from making spectrum allocations by waiver, which, without saying so, is in effect precisely what the Petitioner seeks here. The process short-circuits the well-established and fully functional procedures for international and domestic frequency allocations and spectrum management. These procedures typically and properly involve compatibility showings, and detailed consideration of the impact of a new service on incumbent licensees. Making spectrum allocations by waiver is manufacturer-specific (which is inherently unfair to other manufacturers of similar equipment) and frustrates competition. It also avoids the studies that are necessary in order to assess compatibility with incumbent users. With respect to the 420-450 MHz band specifically, both NTIA and the Commission have repeatedly found difficulties with adding to incumbent services due to the sensitivity of the band, which is used principally for military radars. *See, e.g. Terry Mahn, Esquire, DA-06-2501*, released December 13, 2006 (Part 90 waiver request for indoor positioning system for medical applications at 433 MHz denied).³ A proposal for a permanent waiver of the Commission's Rules to permit nationwide marketing and use on a licensed basis of land mobile short-range transmitters, benefiting as it does only one manufacturer to the exclusion of all others, is an inferior method of conducting spectrum allocations and spectrum management. Petitioner should be required to refile its proposal as a petition to modify the Table of Allocations for this purpose. Its petition should be vetted in the normal course, and would be properly evaluated based on a complete technical compatibility showing, which is not included in the present Waiver Request.

³ In that case, the Commission held that: "we do not believe that the public interest requires grant of a waiver merely to accommodate a manufacturer's choice of a specific frequency when others are available."

4. As it is, Petitioner has submitted no technical specifications for the device; no frequency stability information; no emission designator, no necessary bandwidth information, no antenna gain information, and only the most rudimentary technical data about the device. Apparently, certification of the device would be based solely on whatever specifications the Petitioner chose to submit, since there are no technical limits for this type of device in this band. There are no rules for it. For all these reasons, the waiver request is deficient, and is not grantable in its present form. While the Commission is required to take a “hard look” at waiver requests,⁴ where, as here, the requisite hard look does not reveal a factual predicate for the requested relief, the Commission’s inquiry need and should go no further.

5. With respect specifically to the merits of Petitioner’s choice of frequency band, the Request fails to establish that the 420-450 MHz band is the only viable choice and that no other band would be suitable; an obligation of the Petitioner in order to entitle it to a waiver. The request boils down to a claim that the 902-928 MHz and 2400-2483.5 MHz bands are unsuitable for non-specific propagation reasons and battery size problems, and therefore a band below 450 MHz was necessary. The conclusion does not properly flow from the very limited statement of the premises by Petitioner. First, even if it is correct that the 902-928 MHz band is not suitable for this purpose, the Waiver Request does not demonstrate that; it merely claims that it is true. Nor does it show that other bands are equally unsuitable. Petitioner has not shown that any of the allocations set forth in Section 90.20 of the Commission’s rules for Part 90 public safety land mobile

⁴ See *WAIT Radio v. FCC*, 418 F.2d 1153, 1158 (D.C. Cir. 1969), *cert. denied*, 409 U.S. 1027 (1972); see also *Family Stations, Inc. v. DirecTV, Inc.*, *Order on Reconsideration*, 19 FCC Rcd 14777, 14780 (MB 2004).

applications are not suitable by means of waiver only of the Part 90 service rules, rather than a waiver of the Section 2.106 Table of Allocations.

6. It is certainly not established in the Request that the 902-928 MHz band is not suitable or that the device could not operate in the 902-928 MHz band. In fact, the Commission has had pending since 2005 a very similar waiver request to permit marketing and use of Part 15 analog and video surveillance devices for essentially identical purposes in the 902-928 MHz band. That waiver, sought by Octatron, Inc. and Chang Industry, Inc. (*see*, ET Docket 05-356) seeks to use up to one watt of power in an analog emission at 902-928 MHz for portable, hand-launched devices for law enforcement audio and video surveillance, as is the case with Petitioner's device. The claimed need for waiver of rules governing unlicensed devices in that proceeding for use of the 902-928 MHz band was due to the choice of the manufacturer to use analog, rather than digital, emissions in that band. It is difficult, looking at the four corners of the instant Waiver Request, to determine in what respect the Petitioner's device differs from that of Octatron and Chang.⁵ Likewise, the need for waiver here is due to some voluntary choices made by the manufacturer of emission type and frequency band, not because of any inherent inability to utilize the high-power Part 15 bands under existing Part 15 rules. The bare conclusion offered by Petitioner in this proceeding that neither the 902-928 MHz band nor the 2400-2483.5 MHz band offers "adequate propagation at acceptable power levels" if the device is "projected into a building" is completely insufficient to establish the premise and justify the waivers requested. What is the operational range of the device, such that a one-watt transmitter at either 902-928 MHz or 2400-2483.5 MHz

⁵ That waiver proposal in turn, stemmed directly from a similar petition filed by Remington Arms Company for similar devices in the 2400-2483.5 MHz band earlier in 2005. See, ET Docket 05-183, Order released November 18, 2005, FCC 05-194.

is not capable of transmissions over the very short distances that are required from the inside of a building to the outside of that same building? What is the receiver's sensitivity? Nothing in the four corners of the request indicates anything that would verify the factual conclusions offered. The Waiver Request boils down to "trust us, we have checked into this." But the Commission's waiver standards require much more than that. How does the device of Petitioner differ in terms of its effective transmission range from that of the Octatron and Chang device or from the Remington Arms Company waiver for a similar device at 2400-2483.5 MHz? Should similar devices, that serve virtually identical functions, all be granted different waivers for operation in different bands, under different regulatory structures? It is precisely these duplicative efforts and *ad hoc* equipment authorizations that make the waiver process completely inappropriate for authorizing a new type of device, service or system.

7. The real rationale for the selection of the 420-450 MHz band by Petitioner is disclosed on page 2 of the Request. This device was manufactured by Petitioner for use by the United States military in Iraq, where frequency allocations are not the same as they are domestically. Rather than reconfigure the product to operate in domestic applications in accordance with the domestic Table of Allocations, and in accordance with domestic Part 90 or Part 15 rules, the manufacturer's own prior choices are dictating the alleged "need" for the waiver. As the Commission has stated previously, manufacturer choices do not constitute a valid basis for grant of a permanent waiver to permit part 90 land mobile operations. This is especially true where the proposed use falls well outside the Table of Allocations.

8. Since the Petitioner has admittedly failed to ascertain, much less explain, the specific rules that would have to be waived, it cannot be determined whether or not the underlying purposes of the rules would be frustrated by grant of the proposed waiver in this case.⁶ A waiver cannot be granted without such a finding (47 C.F.R. § 1.925). As well, the interference analysis in the Waiver Request relative to Amateur Radio operation, such as it is, is woefully incomplete and inadequate to justify the relief requested. First of all, Petitioner states that it is “confident” that it can “add to the mix” of incumbent users without significantly increasing the risk of harmful interference. ARRL has no evidence that would allow it to share this confidence, because Petitioner has offered virtually nothing in support of its own confidence level. The three channels used by the device are essentially alternative channels in a given area. There is no proposal for coordination of the use of these channels with incumbent Amateur Radio operators, on either a local or national basis, and indeed, such would be impractical in this context. For purposes of interference avoidance *ex ante*, Petitioner states that it can avoid Amateur Satellite Service downlinks because only Channel C (430-436 MHz) utilizes those frequencies. There is no plan to determine where, however, Channel C should or can be used. There is no indication that the licensed user will have any interest in avoiding channels where Amateur Satellite Service receivers are in use, or that there will be any ability on the part of the user to determine where those receivers will be in use. Then, in a startlingly naïve and mistaken analysis on page 11 of its Request, Petitioner states that interference is “highly unlikely” to Amateur Satellite Service receivers because, though such receivers are high-gain, in order to receive weak signals from satellites, they “nearly always operate at angles of elevation well above the horizontal.” Therefore, it concludes,

⁶ See 47 C.F.R. § 1.925.

since the Recon Scout device is used most often at or near ground level, at “inherently low power levels” interference is unlikely.

9. Amateur Satellite Service receivers are operated at all azimuths, and all elevations, since Amateur Satellites are not geosynchronous. The antennas are often pointed toward the horizon, and during such operation, receive very low-level signals, with low signal-to-noise ratios. There is absolutely no factual basis for the allegation that the Petitioner’s device will be “undetected” by an Amateur Satellite Service receiver, and the conclusion that an Amateur antenna will “be aimed well above the unit” is simply not true. Far from being “all but impossible,” the Petitioner’s device will cause unpredictable, and potentially substantial interference to ongoing Amateur Radio operations.

10. Nor is interference to Amateur Satellite operation the exclusive concern. There are differing Amateur operations throughout the 420-450 MHz band. On Petitioner’s Channel C, for example, there are weak-signal terrestrial, point-to-point operations that involve exceptionally long-distance propagation and utilize extraordinarily sensitive receivers between 432 and 433 MHz; auxiliary and repeater links between 433 and 435 MHz, and international satellite operations above that range. Channel A, at 442-448 MHz, is used for Amateur repeater inputs and outputs, with band plans varying by locality, and also for Amateur television repeater inputs. These repeater inputs, both for voice and video, are at high locations where line-of-sight to the Petitioner’s devices should be expected anywhere in the United States. Repeaters in this band are routinely used for emergency communications via Amateur Radio for numerous served agencies including FEMA, and so at times when the Petitioner’s device may be expected to be used, the repeaters may be expected to be in operation in the same areas.

For this reason as well, interference *to* Petitioner's device may be expected on a regular basis from Amateur Radio operations. While it is all well and good for the Petitioner, a manufacturer, to suggest that it understands that operation of the device would be subject to interference received from licensed users in the band, such interference is not a comforting thought for licensed radio amateurs who could very easily be perceived to be, or held responsible for the failure or malfunction of these analog devices in a given application and the danger to public safety officers who are relying on them. It is also too much to expect that a Public Safety licensee will understand that the use of the device is unpredictable because interference to the device is unpredictable. Petitioner is correct about one thing: Amateur Radio operators take their relationship with First Responders very seriously. Creating fundamental incompatibility between Public Safety communications and Amateur Radio operations serves no one well at all, and for this reason, Petitioner should reconfigure its device to operate in a different allocation.

11. Finally, Channel B of the device, 436-442 MHz, overlaps international Amateur Satellite operation and Amateur wideband television inputs. As mentioned above, there is no plan that the Petitioner has for coordination of these operations, and given the nature of deployment of the devices and given the mobile as well as fixed, itinerant and ubiquitous nature of Amateur Radio operation at 420-450 MHz, the proposed use is facially incompatible and interference in both directions is both likely and unpredictable. ARRL is not seeking to deprive the Public Safety community of a device that will benefit their difficult, admirable and important tasks. But the regulatory paradigms that the Commission has established for both allocated services and under Part 15 are workable ones, and waivers should not be substituted for reasoned allocation

decisionmaking or as a substitute for use of modern Part 15 technologies that will not cause interference to licensed services. For example, the purpose of the generous power limit and power spectral density limit for operation in the 902-928 MHz band, and of the Section 15.249 limit, was to permit higher power Part 15 Spread Spectrum devices in those bands. Later, the rules were amended to permit any wide-bandwidth digital devices in the band, on the theory that there was no greater interference potential to licensed radio services from such devices than from spread-spectrum devices. The purpose of those rules was to permit devices and applications such as that proposed by Petitioner here. Another alternative would be the upcoming 700 MHz allocations for public safety. By contrast, there is no record on which Petitioner, or the Commission, could premise a reasoned finding that there will not be substantial interference potential from analog devices operated at the power level proposed herein at 420-450 MHz. There is no reason why this waiver should be granted, even temporarily, and most certainly not on a permanent basis. Rather, the Petitioner should be required to initiate a rulemaking proceeding, and to prove their concept, perhaps in the Spectrum Test Bed, thus to establish the performance and interference potential of the device.

12. The Petitioner asserts, without establishing, that there is a market for these devices for public safety and anti-terrorism efforts. Merely by suggesting that these devices may be potentially useful in this context does not establish that a permanent waiver for the devices will be in the public interest. Most importantly, it is not satisfactorily established why alternatives are inadequate. It is implied by Petitioner, for example, that digital emissions are inadequate, and analog emissions are necessary. The Commission is reminded that very small, battery-operated COFDM transmitters are used

to send broadcast quality video substantial distances, from racing cars at speed, in harsh RF environments, for long periods of time at or near 2 GHz. Digital emissions are not any less robust than analog emissions for the proposed application. The simple fact is that it costs the manufacturer less to make analog devices. Therefore, the profit margin on each sale is higher if Petitioner's waiver is granted. This is not a valid basis for a waiver grant.

13. The manufacturer here has made a choice as to how to engineer its product. It now seeks to avoid the regulatory consequences of its decision and attempts to conduct rulemaking by rule waiver. These are not "unique or unusual factual circumstances," as are required for a rule waiver pursuant to Section 1.925. Rather, they are circumstances entirely of the manufacturer's own making. The manufacturer wants to establish a market for the devices, but that alone does not mean that the devices are necessary or beneficial for public safety or antiterrorism activities, as opposed to a device that can be operated in an existing Part 90 mobile allocation, with or without Part 90 waivers. It cannot under any circumstances be said that the manufacturer has no reasonable alternatives. One alternative, for example, would be to configure the device to operate exclusively at 2450-2483.5 MHz, where there is already a public safety allocation, and propose to license the devices. Another alternative would be to configure the devices as digital devices and operate them under the Part 15 rules, thus obviating the necessity for the waiver. A third would be to operate the devices at 700 MHz.

14. The Commission should not grant this waiver, either permanently or even temporarily. Petitioner should be required to initiate a rulemaking proceeding if it feels that the Part 90 or Part 15 rules governing analog devices are not sufficiently accommodating and should be changed, and could be changed consistent with

interference avoidance. Repeatedly granting waivers for analog devices which do not meet the fundamental interference avoidance requirements of the existing rules is bad spectrum management and ill-serves the Amateur Service and potentially competing manufacturers.

Accordingly, ARRL, the National Association for Amateur Radio, respectfully requests that the Request for permanent waiver be denied. Alternatively, if the Commission is inclined to grant the waiver, which it clearly should not, the waiver should be granted only temporarily, in order to permit time for redesign and reconfiguration of the devices to operate in accordance with the Commission's existing rules.

Respectfully submitted,

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May 27, 2008

CERTIFICATE OF SERVICE

I, Christopher D. Imlay, do hereby certify that I caused to be mailed, via first class U.S. Mail, postage prepaid, a copy of the foregoing COMMENTS OF ARRL, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO, to the following, this 27th day of May, 2008.

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