

**In the Matter of MSSSI's Request for a Waiver of Part 15 of the FCC Rules  
ET Docket 06-103**

Comments of the National Spectrum Managers Association

*Introduction*

The National Spectrum Managers Association (NSMA) is a voluntary association of individuals involved in the spectrum management profession. NSMA's goal is to promote rational spectrum policy through consensus views formulated by representatives of diverse segments of the wireless industry.

NSMA hereby submits its comments with regard to the Multispectral Solutions, Inc. request for a waiver of the Part 15 rules.

*Background*

Multispectral Solutions, Inc. (MSSI) has requested a waiver of the FCC's Part 15 rules that would allow its Sapphire DART RFID product, operating in the 5925 – 7250 MHz band, to emit 12.75 dB more peak power than is presently allowed. The power increase is needed to allow its product to operate over sufficiently long distances to be able to effectively track livestock grazing across large areas, and to allow emissions from its product to penetrate walls and other materials to enable tracking of personnel in and around petrochemical facilities. MSSI's waiver request implies that the former application could become widespread, as the U.S. Department of Agriculture may require that "each farmer, stockyard owner and feeder keep an electronic record of every head of cattle as it passes through their business."

*Discussion*

A wide range of services operate in the band 5925 – 7250 MHz, including the fixed microwave, satellite, auxiliary broadcasting, cable TV relay, and radio astronomy services. Many of the services operate in, across, or over rural or remote areas in which MSSI's Sapphire DART product could be deployed. Large numbers of enhanced-power RFID tags have the capability of aggregating to produce harmful interference to these services.

Many Fixed Service links operate in this band, including state and local government systems that provide safety-related services. Fixed links normally employ high gain antennas, with main-beam gains reaching 40 dB or more. For antenna centerline heights used in relatively flat terrain, ground locations in the 1 to 5 mile range are often line-of-sight to the receive antenna and locations along the path have little antenna discrimination to reduce the strength of interfering signals from the ground. Seemingly low-power emitters are capable of causing harmful

interference.<sup>1</sup> The broadband nature of the MSSSI interference increases the ambient noise floor, thereby decreasing the design fade margin of the fixed link, which in turn decreases the path availability.

Space borne receivers in the Fixed Satellite service operating in the 6525 – 7025 MHz could be subject to the aggregate effects of a large but presently indeterminate number RFID tags operating across the satellite receiver's terrestrial footprint. If such tags become commonplace (as MSSSI suggests), the number could be in the millions. Because the Sapphire DART's broadband signal occupies 1,187 MHz of the 5925 – 7250 MHz band (or nearly 90% of the available bandwidth), avoiding interference in the frequency domain is essentially impossible.

The Radio Astronomy Service (RAS) operates in the band 6650 – 6675.2 MHz in accordance with footnote US342 to the U.S. table of frequency allocations. Several RAS facilities operate in close proximity to livestock herds. For example, the National Science Foundation's Very Large Array facility in New Mexico is embedded within and surrounded by hundreds of thousands of acres of grazing land. RAS facilities are extremely sensitive to exactly the form of broadband transmissions that emanate from wideband systems such as MSSSI's Sapphire DART product. For this reason, the use of RFID tags, even within existing Part 15 emission limits, in the vicinity of a radio astronomy observatory is likely to produce interference detrimental to the operations of the observatory. The deployment of large numbers of RFID devices, operating at even higher power levels than presently allowed, will create commensurately higher levels of interference.

Section 15.250 requires that the fixed infrastructure of the system – the tracking receivers – must be located indoors. Therefore it appears that for livestock tracking the animals will have to be in a rather short distance of the barn where the receivers are located even if the requested power increase is allowed. But MSSSI has not provided any information at all about why the tracking distance at the present power level (~200 meters) is insufficient while the distance with the higher power level would be sufficient to justify the increased interference potential associated with perhaps hundreds of thousands (millions?) of outdoor tags. MSSSI should engineer interference mitigation measures into the tags, such as requiring an enabling signal for the tags to transmit as in Section 15.519. Indeed, one justification for permitting the higher 0 dBm/50 MHz peak power level that was allowed in the Order – that “authorized systems would generally be located in remote areas...” – would be turned on its head by allowing a waiver for an even higher peak power level in the very remote areas (livestock grazing areas) where the Commission assumed the licensed facilities would be located.

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<sup>1</sup> Short-duration, impulse energy from unintentional radiators (for example, malfunctioning ignition systems of internal combustion motors powering irrigation pumps) has in the past been identified as the cause of continuous error conditions in point-to-point microwave systems operating in unfaded conditions.

MSSI asserts that the operation of their devices under current Part 15 emission limits have occurred “without any interference to sensitive medical equipment or other wireless services.” MSSI further asserts that over the past year some of their devices have been operating at higher power levels under experimental licenses, and that “no reports of interference were received.” In the former case, NSMA questions how MSSI would know if any interference was caused by an MSSI product, since there is no way for a victim service to know the operator, manufacturer, or location of the interference source. In the latter case, the absence of interference complaints does not mean that interference did not occur, or would not occur under slightly different circumstances, only that its source may not have been identified or that it went unreported. In other words if there is no active search for interference into receivers that could be harmed then “the absence of the evidence of interference does not imply that interference is absent.”

More generally, NSMA objects to increased emission limits for Part 15 devices. By their very nature, such devices are almost impossible to track down in the event of interference. Wideband and UWB devices represent a particularly serious threat to licensed services due to the large bandwidths over which their emissions are allowed and the exponential increase in the number of deployments, such as the applications proposed by MSSI. In the Second Report and Order and Second Memorandum Opinion and Order (FCC 04-285) the Commission set the peak power limit considering the interference potential to the fixed, fixed-satellite, and mobile systems used in the 5925-7250 MHz band. The waiver request does not sufficiently explain how the benefits to the public in the two cases (petrochemical facilities and livestock) justify overturning the Commission’s recent decision, or how the interference the Commission was concerned with would be mitigated in these cases. The proper avenue for establishing the viability of a power increase is through a rulemaking petition.

### *Conclusion*

NSMA opposes MSSI’s request for a waiver of the Part 15 rules.

Signed,



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