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FEDERAL COMMUNICATIONS COMMISSION
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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington DC 20554

In the Matter of	)	
	)	
Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems	)	PR Docket No. 93-61 RM-8013

REPLY COMMENTS OF SYMBOL TECHNOLOGIES, INC.
IN RESPONSE TO THE
PUBLIC NOTICE OF FEBRUARY 9, 1994

Symbol Technologies, Inc. ("Symbol"), a major manufacturer of Part 15 spread spectrum data communications equipment, hereby submits these Reply Comments in response to the Commission's Public Notice of February 9, 1994, as supplemented by its Order of February 25, 1994.[1/]

The original Notice of Proposed Rule Making in this docket proposed a new Location and Monitoring Service ("LMS") in the 902-928 MHz band.[2/] A major issue in the first round of comments and replies, and in subsequent ex parte contacts, is the

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1/ Additional Comment Sought on Ex Parte Presentations, PR Docket No. 93-61, Public Notice DA 94-129 (released Feb. 9, 1994); Order, PR Docket No. 93-61, DA-94-178 (released Feb. 25, 1994). Symbol is the leading manufacturer of portable bar code driven data transaction systems, with 2.5 million scanners and hand-held computers installed. Symbol designs, manufactures, and markets bar code laser scanners, portable computers, and spread spectrum data communications networks that are used as strategic building blocks in technology systems for retail, warehousing, distribution, manufacturing, package and parcel delivery, health care, and other industries.

2/ Automatic Vehicle Monitoring Systems, 8 FCC Rcd 2502 (1993).

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compatibility of LMS technology and the near-ubiquitous Part 15 systems already using the same band. This second round of comments and replies was prompted in part by a technical filing from Teletrac, an LMS proponent, that claimed to "improve[] the environment for Part 15 devices."[3/]

A large number of comments were filed in this second round by LMS interests and Part 15 interests alike. The Part 15 commenters (including Symbol) almost unanimously challenged Teletrac's claim that its proposal would improve the prospects for Part 15. Of the LMS proponents that filed, most concentrated on internecine disputes among LMS technologies; only Teletrac made any serious effort to address issues relating to Part 15.

Some LMS proponents did suggest that Part 15 users gratefully accept Teletrac's proposal to reduce the spectrum allocation for wide area wideband use from 16 MHz to 10 MHz. The suggestion is somewhat naive; many Part 15 spread spectrum systems require a bandwidth greater than the 16 MHz that Teletrac proposes to protect from wide area wideband signals, and some use the entire 26 MHz available in the band. Even if all Part 15 users could somehow squeeze their operations into 16 MHz, the suggestion still overlooks the millions of Part 15 units already transmitting on frequencies outside that 16 MHz; and even the 16 MHz will be crowded with other LMS traffic. Finally, LMS

[3/] Letter from John Lister, President and co-CEO, Pactel Teletrac, to Ralph A. Haller, Chief, Private Radio Bureau, FCC at 1 (Jan. 26, 1994). See also Order, PR Docket No. 93-61, DA-94-178 (released Feb. 25, 1994).

proponents themselves are divided on issues of frequency allocation, some having filed to challenge Teletrac's proposal as self-serving. Particularly in the face of competition among LMS technologies, the outlook for Part 15 operations is highly uncertain.

TELETRAC'S PROPOSED DEFINITION OF "HARMFUL INTERFERENCE" NOT ONLY IS SELF-SERVING, BUT BELIES TELETRAC'S REPEATED CLAIMS THAT ITS TECHNOLOGY CAN TOLERATE INTERFERENCE FROM PART 15.

Teletrac's most recent Comment in this proceeding proposes a new definition of "harmful interference," presumably to replace Section 15.3(m) for resolving disputes between LMS and Part 15:

> A Part 15 device will be considered a source of harmful interference if the signal level from that device exceeds the average interference and noise floor at an LMS receiver by more than 10 dB for more than 20% of the time over any 60 second period (10% if the signal exceeds the 10 dB limit at more than one LMS receiver).[4]

The choice of definition is important because "harmful interference" is the trigger event that sanctions an LMS provider's assertion of spectrum priority over a Part 15 user.[5] The present definition reads:

> Harmful interference. Any emission, radiation or induction that endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunications service operating in accordance with this chapter.[6]

4/ Comments of Pactel Teletrac at 10 (filed Mar. 15, 1994).

5/ See 47 C.F.R. §§ 15.5(b) & (c), 15.15(c).

6/ 47 C.F.R. § 15.3(m).

Teletrac asserts that its proposed definition would "enhance the stability of the Part 15 environment," presumably by providing a more objective determinant of interference than the present rule does.[7] But any such objectivity is illusory. An acceptable interference level must be referenced to a specific power level over a particular bandwidth. Teletrac, however, has neither published the noise floor of its receiver nor specified a measurement bandwidth -- both of which are critical to its definition. (One example of a reasonable specification for a noise floor might be -90 dBm over 10 MHz.) Not having identified the values it intends to use, Teletrac would be free to manipulate its definition.

Moreover, Teletrac's proposal belies its repeated claims that its technology can successfully tolerate interference from Part 15 devices. Part 15 manufacturers and users have stated several times that Teletrac's technology is fragile, while Teletrac has repeatedly insisted that such assertions are incorrect.[8] In its March 15 filing, however, Teletrac seeks a

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[7] Comments of Pactel Teletrac at 10. Teletrac's proposal also may be motivated in part by the possibility that the present definition would leave most of its operations completely unprotected. The present definition implies that only radio navigation services, other safety services, and radiocommunications services can be subject to harmful interference. Many of Teletrac's potential applications do not clearly qualify for any of these categories. The proposed definition would avoid this problem by referring expressly to LMS.

[8] Most recently: "Teletrac continues to believe concerns raised by the Part 15 community are misplaced, and that most Part 15 devices will not cause harmful interference to wideband systems . . . ." Comments of Pactel Teletrac at 10-11. "LMS are

10 dB limit on received interference. A receiver susceptible to interference at 10 dB over its noise floor can hardly be considered anything but fragile. This specification on Teletrac's part is strong support for claims that its LMS system has very low tolerance for interference.

Finally, Teletrac's proposed definition allows only a 20% transmit duty cycle during any 60 second period. Part 15 wireless computer local area networks, which are common in the 902-928 Mhz band, often operate at higher duty cycles. Again, if LMS were truly tolerant of interference, it would be able to operate in the presence of continuous Part 15 activity.

Symbol does agree with Teletrac that an objective standard for harmful interference would be a workable alternative to the present rule, so long as the standard specified a noise floor, bandwidth, and reasonable tolerance. To that end Symbol proposes the following alternative definition for "harmful interference" to LMS from Part 15 operations:

> A Part 15 device will be considered a source of harmful interference to LMS if its signal power in a 10 MHz bandwidth, corrected for antenna factors, exceeds -80 dBm (10 dB interference over a -90 dBm noise floor) averaged over any 60 second period, or -60 dBm peak.

Symbol and others have previously documented the size, sophistication, and economic importance of spread spectrum

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designed [sic] to accept a certain degree of interference, and the low power, limited range of Part 15 devices are not likely to cause problems." Id. at 9.

operations at 902-928 MHz.[9] Symbol need not restate those facts here. It nonetheless bears emphasis that the introduction of LMS would threaten a technology that is in very widespread use, and which benefits all Americans today by reducing costs and improving performance in every sector of the economy. Teletrac's recent filings only substantiate that threat.

CONCLUSION

Teletrac's proposed definition for "harmful interference" is unnecessarily vague and open to abuse. The proposal also undercuts Teletrac's repeated assertions that its technology is tolerant of interference from Part 15 devices. The Commission should not license LMS as proposed.

Respectfully submitted,

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[9] E.g., Comments of Symbol Technologies, Inc. at 3-7 (filed Mar. 15, 1994).