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FEDERAL COMMUNICATIONS COMMISSION  
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BEFORE THE  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 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

COMMENTS

OF

METRICOM, INC.

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## SUMMARY

On January 26, 1994, PacTel Teletrac submitted a new technical proposal in this proceeding which it claims will "improve" the environment for Part 15 devices operating in the 902-928 MHz band. Under the new proposal, PacTel will operate broadband LMS systems on 10 MHz, rather than 16 MHz, of spectrum within the band. Metricom, Inc. ("Metricom") vehemently disagrees with PacTel's assertion. It would be a serious mistake for the Commission to view PacTel's proposal as a reasonable compromise in this proceeding.

The record clearly demonstrates that PacTel's proposed LMS systems simply cannot coexist with Part 15 devices which operate in the 902-928 MHz band. PacTel's new proposal does absolutely nothing to resolve interference problems which it will encounter from the millions of existing devices which currently operate throughout the entire band. Moreover, because of interference to LMS, PacTel's proposal will lead to the rapid degradation of the Part 15, 902-928 MHz band because the potential for spectrum overcrowding within the band will, almost immediately, force Part 15 manufacturers to cease operations and production of unlicensed devices which operate in the band. In addition, the Commission will be forced to devise ways to police the millions of devices already operating in the band.

Metricom continues to believe that the Commission should abandon its proposal to establish LMS. The use of inefficient LMS technology, such as that proposed by PacTel, should not be rewarded

-- especially when it threatens to undermine an industry which offers so much promise, and which has developed with the encouragement of the Commission. The Part 15 industry is of increasing importance to our economy; PacTel's LMS is not. High performance, low cost, robust and reliable wireless communications, products and systems are being made available as a result of the Part 15 rules to millions of users in government, education, medicine and business. These benefits should not be denied to the public for PacTel's LMS technology.

In the alternative, if the Commission decides to establish LMS, it should issue a Report and Order which states that LMS must coexist with Part 15 devices; therefore, the wideband LMS operators would not have the right to demand the shutdown of the Part 15 device. PacTel should not be permitted to argue, on the one hand, that there is no realistic potential for interference from Part 15 devices, and to expect, on the other hand, that it can demand a shutdown of offending Part 15 equipment if actual interference occurs.

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To The Commission:

COMMENTS OF METRICOM, INC.

Metricom, Inc. ("Metricom"), by its attorneys, hereby submits these Comments in response to the Public Notice (DA 94-129) released in the above-captioned proceeding on February 9, 1994. The Public Notice requested comments on ex parte submissions made in this proceeding by PacTel Teletrac ("PacTel") on January 26, 1994, Southwestern Bell Mobile Systems, Inc. ("SBMS") on February 2, 1994 and February 7, 1994, and MobileVision on February 1, 1994.<sup>1/</sup>

PacTel's ex parte submission includes a new technical proposal which it claims will "improve" the environment for Part 15 devices. As discussed below, PacTel's new proposal does nothing to improve the Part 15 environment. Moreover, it fails to address the serious interference concerns that have been raised in this proceeding by

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<sup>1/</sup> On February 25, 1994, the Commission released an Order (DA 94-178) which clarified that interested parties may comment on any of the new issues raised by these ex parte filings. The Order also extended the date by which comments must be filed to March 15, 1994.

the Part 15 industry. It would, therefore, be a grave mistake for the Commission to view PacTel's proposal as a reasonable compromise capable of resolving the substantial technical, legal and policy issues raised by Metricom and other parties on the record in this proceeding.

**I. BACKGROUND**

**A. Statement of Interest**

1. Metricom is a rapidly growing U.S.-based manufacturer of Part 15 frequency hopping, spread spectrum, wireless data communications systems. Metricom's systems provide an innovative mesh network architecture which offers the first license-free wireless solution to provide low cost, high speed, flexible, regional data communications for a wide variety of applications that serve the public interest. Metricom's position in this proceeding, as articulated in its previously filed Comments and Reply Comments, is that the Commission should abandon its proposal to create a new Location and Monitoring Service ("LMS") because, by reason of interference, wideband LMS systems such as those proposed by PacTel and MobileVision cannot coexist with the millions of Part 15 devices that currently operate in the 902-928 Mhz band.<sup>2/</sup> If the Commission decides that it must create LMS, Metricom has taken the position that the Commission should do so only if it makes PacTel's

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<sup>2/</sup> See Comments of Metricom filed June 29, 1993, and Reply Comments filed July 29, 1993.

LMS accept equal status with authorized Part 15 users of the band<sup>3/</sup> so that LMS will not deprive the American public of the many new advanced, low cost, applications for wireless communications which have been developed by Part 15 manufacturers.

**B. Part 15 Operations**

2. Section 15.5(b) of the Commission's Rules requires Part 15 devices to accept interference from and, more importantly in the context of this proceeding, not cause interference to, licensed services.<sup>4/</sup> Throughout this proceeding, PacTel has made it clear that it wants the Commission to give LMS licensees the full benefit of the protection afforded by Section 15.5(b). Therefore, PacTel and other LMS licensees are requesting authority to demand that the user of an unlicensed Part 15 device discontinue operating the device if it interferes with LMS operations. If the owner of the device ignores the LMS licensee's demand, the LMS licensee can petition the FCC to force the shutdown of the device.<sup>5/</sup>

3. Part 15 devices rarely cause interference to licensed services because the FCC's rules are correctly premised on the assumption that such devices will operate at such low power that the potential for actual interference to licensed services is virtually non-existent. This regulatory philosophy has been

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<sup>3/</sup> See, e.g., Ex parte presentation of Metricom filed January 13, 1994.

<sup>4/</sup> 47 C.F.R. § 15.5(b) (1992). It has been stated unequivocally by Part 15 manufacturers that Part 15 devices will cause interference to PacTel's wideband LMS receivers. See, e.g., TIA Study, filed October 22, 1993.

<sup>5/</sup> 47 C.F.R. § 15.5 (c) (1992).

articulated by the Commission on many occasions.<sup>6/</sup> Moreover, because Part 15 devices must operate in an environment where they must accept interference from other authorized users in the band, Part 15 devices in general, and Metricom's in particular, are extremely robust and capable of operating in a crowded environment.

4. The proposals at issue in this proceeding are truly unique because PacTel's wideband LMS technology, which would be deployed throughout the United States, is extremely susceptible to, and will receive interference from, even low power spread spectrum devices, the types of devices which are the least likely devices to cause interference.<sup>7/</sup> The incompatibility of PacTel's technology with existing users of the 902-928 MHz band explains why the Part 15 community has been extraordinarily vocal in its opposition to the proposed LMS rules.

#### C. The PacTel LMS Proposal

5. PacTel has failed to justify the creation of permanent AVM rules, let alone justify a more expansive proposal. PacTel has

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<sup>6/</sup> For example, in its comprehensive rewrite of the Part 15 rules, the Commission stated that it was adopting technical standards that it believed would "minimize the probability that harmful interference will be caused to authorized radio services while still permitting effective economical operation of such devices in most frequency bands." [Emphasis added.] First Report and Order, Gen. Docket No. 87-389, 4 FCC Rcd 3439 at 3496 (1990). In the same proceeding, the Commission addressed the issue of interference in the 902-928 MHz band stating: "We believe that the probability that Part 15 operations will cause interference to authorized services in the ISM bands above 900 MHz is low... [T]he potential for a Part 15 device to receive interference is much greater than the potential for the Part 15 device to cause interference." [Emphasis added.] Id. at 3502.

<sup>7/</sup> See Section II.A. infra.

argued that "regulatory certainty" is necessary in order to attract further investment in LMS. This is absurd. Last year PacTel raised \$1.38 billion as a result of a stock offering which brought an 11% premium above the offering price.<sup>8/</sup> The fact is that PacTel's AVM business has failed. Despite holding hundreds of licenses for nearly every metropolitan area and state in the country, it has, after several years, only 6,000 subscribers in six systems, and PacTel is losing tens of millions of dollars each year on this service. PacTel's technology is old, fragile and inefficient, and it is not competitive with other communications technologies offering the same types of services.<sup>9/</sup> Consequently, PacTel's request for permanent AVM rules is nothing more than a thinly veiled request for spectrum exclusivity as a cure for technological weaknesses in the design of its system. To grant its request to warehouse frequency spectrum for some undisclosed reason is clearly not in accord with the public interest.

6. Even though Pactel's AVM business is failing, it now wishes to expand the types of services which can be offered to include monitoring all types of animate and inanimate objects. Expanding the AVM service to LMS, which would allow the monitoring

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<sup>8/</sup> Wall Street Journal (J), Dec. 6, 1993, p.B4.

<sup>9/</sup> It is interesting to note that even PacTel may doubt the viability of LMS. In a recent article, it was reported that PacTel and Wireless Solutions would work together to develop and market wireless data solutions for the transportation industry. The companies will focus on, among other things, providing turnkey and customized wireless data applications combining cellular data networks and global positioning system (GPS) for vehicle location and geographic information systems (GIS) tools for mapping display. Communications Daily, Feb. 28, 1994, p.9.

of everything, not just vehicles, increases the potential for interference from Part 15 devices because there will be more signals for the PacTel receivers to seek, including signals from indoor locations.

7. Because LMS is a significant system and application expansion above the current AVM, the radio system requirements (especially receiver sensitivities) will become much more critical to proper system operation. As the record has already demonstrated, the PacTel system is extremely fragile to interfering radio sources within the multi-site receiver passband. Since LMS has been defined to include the location of people and objects in both indoor and outdoor environments, the return transponder signal levels from the indoor environments will be significantly reduced to the receiver locations. This will exacerbate the Part 15 interference to those sites even more, and thereby create an even more fragile system than the current AVM systems. Essentially, the attempt to locate objects and people with the defined PacTel technology will simply be rendered non-operational by the myriad of Part 15 devices in operation.<sup>10/</sup> This will not provide a useable service for locating objects and people.

8. PacTel's strategy has been to lull the FCC into ignoring the crucial factual question of whether Part 15 devices will interfere with broadband LMS. For example, PacTel has ignored, or

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<sup>10/</sup> Building penetration losses at 900 MHz are typically on the order of 30 dB. This means that the return transponder signals from indoor locations into the PacTel receivers will effectively be competing with Part 15 signals with a 30 dB handicap.

misstated, the interference concerns of the Part 15 industry by telling the Commission that its proposed LMS operations should not have "any appreciable adverse effect on Part 15 operators...."<sup>11/</sup> Yet, despite a strong record to the contrary, PacTel presented no objective evidence to support this claim. PacTel has been unwilling to cooperate with the Telecommunications Industry Association ("TIA") in its efforts to find a technical solution to the interference problems, and it has been unwilling to participate in tests to determine the validity of its claim that no appreciable interference from Part 15 operations will occur, a claim which industry experts refute. The Commission must ask itself why.

**II. PacTel's Proposal Does Not Resolve Interference Problems Which It Will Encounter From Existing Users Of The Band.**

**A. The Interference Issue.**

9. PacTel's most recent ex parte submission includes a sudden, dramatic, new technical proposal which is inconsistent with its prior proposal and which PacTel claims will "improve" the environment for Part 15 devices because, under the new proposal, PacTel, and other wideband LMS facilities, would operate on only 10 MHz of spectrum rather than 16 MHz as the Commission proposed in the Notice of Proposed Rulemaking.<sup>12/</sup> The record in this proceeding is very clear on the point that PacTel's proposed LMS

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<sup>11/</sup> PacTel Reply Comments filed July 29, 1993 at 45. This cavalier approach fails to consider that if Part 15 devices do cause interference to PacTel's systems, which the Part 15 community insists will happen, then under the current hierarchical structure, PacTel can force particular Part 15 devices to cease operations.

<sup>12/</sup> Notice of Proposed Rulemaking, PR Docket No. 93-61, released April 9, 1993 ("NPRM").

systems cannot coexist with Part 15 devices which currently occupy the band; Part 15 devices cause interference to the PacTel system. PacTel's new proposal does not change this fact in any way. Accordingly, PacTel's new proposal does absolutely nothing to improve the operating environment for the more than two million Part 15 devices operating in the 902-928 MHz frequency band.<sup>13/</sup>

10. The Commission should not sidestep the factual question of whether Part 15 devices will interfere with wideband LMS systems. The Commission must address this question. If the Commission concludes, as it must, that Part 15 devices will interfere with PacTel wideband LMS systems, the Commission must make one of two policy choices if it decides to proceed with the establishment of LMS in this band. Either the Commission must acknowledge that it simply does not care about how its actions in this proceeding will affect the Part 15 industry (in which case the Commission must also be prepared to deal with the legal, economic and political consequences associated with such a decision), or it must adopt rules which ensure that newly authorized wideband LMS operators cannot exercise traditional preemptive rights over Part 15 devices which operate in the 902-928 MHz band.

11. The record in this proceeding is replete with evidence that spread spectrum Part 15 devices will interfere with PacTel's wideband technology. The record shows, for example, that in 1992,

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<sup>13/</sup> The National Telecommunications and Information Administration estimates that more than two million Part 15 devices already occupy the 902-928 MHz frequency band. U.S. Dept. of Commerce, "Prelim. Spectrum Realloc. Report" at 3-12 (NTIA Special Pub. 94-27, Feb. 1994).

PacTel sent a letter to Sherwin-Williams Company in which it complained of interference from a Part 15 spread spectrum device which was manufactured by Cylink Corporation.<sup>14/</sup> PacTel ordered Sherwin-Williams to immediately cease operating the device:

PacTel Teletrac operates a vehicle location system in the greater Chicago area . . . . I recently noticed a signal causing harmful interference to our system and tracked this interference to your plant . . . . This signal is adversely affecting our system and should be removed from the 904MHz-912MHz frequency spectrum immediately.<sup>15/</sup>

12. The record also includes a technical analysis submitted by Metricom on June 29, 1993, which demonstrated that even under the best of circumstances, a Part 15 spread spectrum device could interfere with wideband AVM systems within an 8.2 mile radius.<sup>16/</sup> On October 22, 1993, a thorough technical analysis was presented to the FCC's Private Radio Bureau by TIA's Mobile & Personnel Communications Consumer Radio Section ("TIA Study"). The TIA Study

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<sup>14/</sup> See Late filed Comments submitted by Cylink Corporation on February 5, 1993 at 1.

<sup>15/</sup> Letter from Henry L. Razor, Network Field Engineer, Pactel Teletrac to George Martin, Sherwin-Williams Company, dated December 29, 1992 (emphasis added). See also Comments of ITRON filed June 29, 1993, at p.5, n.3 ("While installing a meter reading system, ITRON became aware of another company's Part 15 device that was interfering with the Teletrac system miles away"). These situations certainly appear to undermine PacTel's statement in its July 29, 1993 Reply Comments that "Teletrac employs 25 or more receive sites in each city and each wideband pulse is typically received by 6 or more sites. This provides redundancy, so that the Teletrac system is not disabled in case of temporary interference into a receive site" (PacTel Reply Comments, July 29, 1993 at 44 (emphasis added)).

<sup>16/</sup> Comments of Metricom filed June 29, 1993 at Appendix A.

quantitatively addressed the issue of interference from Part 15 devices to the receivers of wideband LMS systems. The Study concluded that "Part 15 devices in the 902-928 MHz band pose a serious interference threat to wideband pulse-ranging AVM systems such as Teletrac's".<sup>17/</sup>

13. Just last month, SBMS submitted a new report from the Mobile and Portable Radio Research Group at Virginia Tech which analyzes several of the technical issues raised by Part 15 manufacturers in this proceeding.<sup>18/</sup> The report reflects the preliminary results obtained by Virginia Tech researchers in connection with their evaluation of relevant interference issues associated with real-world LMS operations. Although the report indicates that "interference issues involving AVM systems and Part 15 devices will require significant further study,"<sup>19/</sup> it states that "when a Part 15 device is operating much closer to a base station than an AVM mobile unit, the transmitted power is large

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<sup>17/</sup> TIA Study, Technical Conclusions at 10 (emphasis added).

<sup>18/</sup> "Capacity and Interference Resistance of Spread-Spectrum Automatic Vehicle Monitoring Systems in the 902-928 MHz ISM Band," Rick Cameron and Brian D. Woerner, Mobile and Portable Radio Research Group, Bradley Department of Electrical Engineering, Virginia Tech, January 14, 1994.

<sup>19/</sup> Virginia Tech Report at 9. Therefore, Metricom agrees with TIA's Comments filed simultaneously with these comments that any order issued at this time creating the LMS based on this record would be extremely premature. Furthermore, Teletrac's new proposal is inconsistent with its prior proposal and the Commission is just now receiving comment on the new proposal. In sum, the record in this proceeding simply does not provide a rational basis upon which the Commission can adopt a set of permanent rules for AVM/LMS systems at this time.

enough to produce a significant near/far problem."<sup>20/</sup> Moreover, Virginia Tech researchers found that "[i]nterference is certainly possible for closely located systems."<sup>21/</sup>

14. Significantly, there is no engineering evidence in the record which disputes the overwhelming evidence that Part 15 equipment will interfere with wideband LMS operations. The FCC cannot ignore this fact. Nor can it ignore the fact that the potential for interference will only increase as millions of new, more powerful, Part 15 devices are introduced into the marketplace in the months ahead.

15. A host of new 902-928 MHz consumer devices, including digital spread spectrum cordless phones, are now being introduced and sold throughout the nation. The proliferation of these devices is sure to create an untenable interference situation for Teletrac's fragile, twenty-year-old technology. The Commission itself has acknowledged the existence of a problem noting that interference such as that experienced by PacTel in Chicago "will likely be a continual concern as new consumer-oriented Part 15 devices . . . are introduced."<sup>22/</sup>

**B. The Commission's Encouragement.**

16. Ironically, the anticipated increase in the number of Part 15 devices in the 902-928 MHz band is a direct result of rule changes the FCC adopted precisely to encourage the development of

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<sup>20/</sup> Virginia Tech Report at 9-10 (emphasis added).

<sup>21/</sup> Virginia Tech Report at 10 (emphasis added).

<sup>22/</sup> NPRM at ¶ 24.

new technologies in the 902-928 MHz band. In 1985, the Commission adopted rules which permitted unlicensed spread spectrum operations in the 902-928 MHz band subject to specified power limits.<sup>23/</sup> Almost immediately, Metricom and other manufacturers began exploring potential new applications for spread spectrum technology.

17. In 1989, in order to further encourage the development of Part 15 products generally, the Commission raised the permissible power limits within the 902-928 MHz band.<sup>24/</sup> More recently, the Commission refined its rules to "significantly increase the potential range of permissible designs for Part 15 spread spectrum systems and thereby broaden the opportunities for development and use of this important new technology."<sup>25/</sup>

18. In response to the Commission's encouragement, Part 15 manufacturers have invested hundreds of millions of dollars in the research, development and production of new commercial and consumer products. Obviously, the Commission's actions were clearly in the public interest. Technological advances have created the ability to provide low cost, reliable, Part 15 wireless communications products and services for all public and private sectors of our economy. Whether those services are communications from a

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<sup>23/</sup> First Report and Order, Gen. Docket 81-413, 101 FCC 2d 419 (1985).

<sup>24/</sup> First Report and Order, Gen. Docket No. 87-389, 4 FCC Rcd 3493 at 3502 (1989).

<sup>25/</sup> Report and Order, Gen. Docket No. 89-354, 5 FCC Rcd 4123 (1990).

wireless phone, the use of wireless products in schools, government offices, or industry laboratories, or communications over a wireless network like that offered by Metricom to control utility power consumption, operate waste water control devices, or to provide data to children with computers in schools which are not wired for computer networks, the public interest and our economy are being well served. To deny those benefits to society in order to enhance PacTel's investment in its old technology is neither wise, nor fair, nor in the public interest.<sup>26/</sup>

**III. PacTel's Proposal Does Nothing To Improve The Part 15 Environment In The 902-928 MHz Band Prospectively.**

19. PacTel's new proposal also does nothing to accommodate Part 15 devices that will be manufactured in the future. PacTel's new proposal implies that manufacturers of Part 15 devices can avoid interference prospectively by designing new equipment that operates only in the 16 MHz of spectrum where PacTel and other wideband LMS systems will not be licensed. However, the Commission

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<sup>26/</sup> Part 15 devices are being used in applications which promote the development of the National Information Infrastructure ("NII") and are, therefore, in accord with national policy concerning the NII. For example, Metricom's spread spectrum devices, which are at the leading edge of wireless data communications technology, are designed for use in many areas of significant public importance including health care, education (including connecting schools to Internet), electric utility management and manufacturing. See Attachment A for a description of these applications.

should not be deceived into believing that this "solution" is a reasonable compromise.<sup>27/</sup>

20. If it is necessary for Part 15 manufacturers to limit their operations to 16 MHz of spectrum, serious capacity problems will result. For example, in the case of frequency hopping systems such as those manufactured by Metricom, there is a linear relationship between a reduction in the amount of spectrum available and system capacity. Specifically, because there is a direct correlation between the amount of spectrum allocated for frequency hopping devices and the amount of data those devices can handle, given interference to LMS from Part 15 devices PacTel's proposal would result in a 40% reduction in capacity for manufacturers of frequency hopping devices. Such a reduction would threaten the economic viability of spread spectrum operations in the band altogether. Moreover, it must be noted that the Commission premised its Section 15.247 spread spectrum rules on Part 15 operations being conducted on all 26 MHz of the 902-928 MHz frequency band, not just 16 MHz. The Commission's actions were correctly based on the assumption that Part 15 operations are

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<sup>27/</sup> While PacTel's new proposal does not specifically seek to have Part 15 devices removed from the 10 MHz of spectrum it is requesting, because the Part 15 community knows that it will cause interference to PacTel's operations, it is only rational for Part 15 manufacturers to design their devices not to operate in these 10 MHz. Therefore, PacTel's proposal de facto prohibits Part 15 devices from operating in the 10 MHz suggested by PacTel.

optimized when they are able to use all 26 MHz the Commission made available.<sup>28/</sup>

21. More importantly, if all Part 15 devices in this band are forced to crowd together at 912-928 MHz, the possibility of interference among the devices will increase dramatically. Spectrum crowding in the band will be particularly acute because PacTel's high power forward link, which is critical to the operation of its LMS systems, occupies 250 KHz of spectrum right in the middle of the 16 MHz of "clear" spectrum where Part 15 devices would be effectively relegated. This forward link is of particular concern to manufacturers of direct sequence spread spectrum devices and will result in further compression of Part 15 operations.<sup>29/</sup>

22. Thus, the Commission must recognize that on a prospective basis, adoption of the PacTel "compromise" will lead to the rapid degradation -- not the improvement -- of the Part 15 environment. Because of the high probability of interference from Part 15 devices, PacTel's proposed compromise would result in a de facto reallocation of the 902-912 MHz band for the exclusive use of LMS systems. Part 15 manufacturers will likely be forced to cease producing unlicensed products which transmit in that 10 MHz of

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<sup>28/</sup> The whole purpose of spread spectrum transmissions are, as the name implies, to spread the RF transmission. To narrow the amount of spectrum available for spreading reduces the benefits and capacity of the service, and runs counter to the notion and intent of spread spectrum services.

<sup>29/</sup> Significantly, PacTel's ex parte filing did not even mention the need for this additional spectrum. PacTel merely stated that its new proposal allocates approximately 16 MHz of spectrum to narrowband AVM providers. PacTel January 26, 1994 ex parte letter at 1.

spectrum, and the Commission will be forced to devise ways to police millions of devices already operating in that band. This would essentially have the effect of creating precisely what the Commission said it did not propose in this proceeding. In an Erratum released on May 5, 1993, the Commission clarified that in considering interference issues between LMS licensees and Part 15 users, it was seeking potential solutions "short of removing Part 15 users . . . from the band".<sup>30/</sup>

**IV. PacTel's Proposal Fails To Address Important Public Policy Issues Which The Commission Must Confront In This Proceeding.**

23. PacTel's proposal fails completely to address the significant public policy concerns which have been raised by Metricom and others in this proceeding. The record shows -- and the Commission has acknowledged -- that PacTel's wideband LMS systems cannot coexist with Part 15 devices which operate in the band. In light of the record, the Commission cannot simply choose to ignore the important concerns which have been raised by the Part 15 community. The FCC must address these issues.

24. The Part 15 industry is of increasing importance to our economy; PacTel's LMS is not. It is not in the public interest to expand the monopoly powers which would be granted if PacTel's LMS proposal were authorized; more significantly, it is not in the public interest to deprive our society of the advances in communi-

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<sup>30/</sup> Erratum (PR Docket 93-61) DA 93-516, released May 5, 1993.

cations technology being brought to American citizens through Part 15 products and services, the development of which the FCC did so much to encourage. Because of this, the Commission should abandon its proposal to create a new LMS in the 902-928 MHz frequency band.

25. Alternatively, if the Commission is somehow convinced that it is in the public interest to proceed with establishing LMS in the 902-928 MHz band, it can avoid dealing with the interference issues that will certainly occur by doing just one thing: The Commission provide in its Report and Order that wideband LMS systems must coexist with interference from authorized Part 15 users of the band. This would mean that wideband LMS operators would not have the right to shut-down Part 15 devices operating in the band if such devices interfere with their LMS systems, nor would Part 15 devices have a right to complain about LMS interference.<sup>31/</sup> Despite the theoretical and practical evidence to the contrary, PacTel has repeatedly told the Commission that the presence of Part 15 devices in the band will not create an interference problem for its systems.<sup>32/</sup> If PacTel and the

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<sup>31/</sup> As the Commission is aware, Part 15 devices are generally robust and not likely to be bothered by LMS systems.

<sup>32/</sup> Metricom does not understand why PacTel would be opposed to prohibiting LMS operators from complaining about interference from Part 15 devices in light of PacTel's assertions that: (i) "Teletrac has designed its system with Part 15 equipment in mind, and we believe that our systems will continue to operate reliably" (Pactel Comments, June 29, 1993 at n.13); (ii) "calculations are consistent with Teletrac's experience that interference from co-channel narrowband LMS transmitters is a serious problem, while Part 15 devices, for the most part, are not" (*id.* (emphasis added)); (iii) there will be only occasional instances where Teletrac and Part 15 users and manufacturers may experience interference (continued...)

Commission believe that this is the case, they can not oppose adoption of this proposal.

V. CONCLUSION

26. Part 15 spread spectrum developmental activities undertaken by American high technology companies over the past several years represent one of the most significant advances in the efficient use of the radio frequency spectrum that the American public has ever witnessed. It is imperative that the Commission not do anything in this proceeding that would limit the flexibility, capacity or availability of the extremely important and useful applications Part 15 devices support now and will continue to support in the years ahead. The Commission should not sacrifice these low cost, highly efficient applications capable of being offered in the public interest by Part 15 devices for the sole purpose of helping one of the world's largest corporations in its efforts to save a failing AVM business.

27. Metricom continues to believe that the proposal to establish LMS should be abandoned. However, if the Commission determines to move forward with its LMS proposal, wideband LMS systems must be required to coexist with authorized Part 15 devices. PacTel must not be permitted to argue on the one hand, that there is no realistic potential for interference from Part 15

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<sup>32/</sup> (...continued)  
problems (*id.*); and, (iv) "the Teletrac system is well able to handle operations in a band with Part 15 users" (Pactel Reply Comments, July 29, 1993 at 44).

devices, and to expect, on the other hand, that it can then ask the FCC to police millions of commercially vital Part 15 devices when interference subsequently occurs.

28. The issue before the Commission involves its most fundamental obligation to act in the public interest and to advance the highest use of the frequency spectrum. Careful comparison of the benefits, if any, derived from expanded use of PacTel's fragile technology, against the promise of the technological revolution being driven by Part 15 developers and manufacturers, which the Commission did so much to encourage, makes it clear that the public interest demands protection of the latter. High performance, low cost, robust and reliable wireless communications products and systems are being made available as a result of Part 15 rules to millions of users in government, education, medicine, and business. Part 15 products and services represent the highest public use of the radio frequency spectrum before the Commission in this proceeding, and that should be protected.

WHEREFORE, Metricom, Inc. respectfully requests the Commission to take further action in this proceeding in accordance with the views expressed herein.

Respectfully submitted,

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Dated: March 15, 1994

## ATTACHMENT A

Metricom's Part 15 wireless data communications systems have been developed for use in many areas that are of significant importance to the public interest. When Part 15 rules are complied with, the opportunity to make use of the relatively large amount of spectrum in the 902-928 MHz band makes it possible to develop high-performance, large capacity, low-cost radio equipment that provides solutions to public and private organizations and to individuals.

Important examples of the benefits provided by Part 15 equipment can be illustrated by citing a number of present and anticipated uses of Metricom's wireless data communications networks. Each of these uses supports an area that is of vital interest to the public good. In each instance cited here, high performance, capacity and reliability in combination with low cost are network characteristics required by the applications. These characteristics are made possible by taking advantage of Part 15 rules permitting license-free network operation in the 902-928 MHz band.

Less expensive electricity, reduced pollution, fuel conservation. Metricom Part 15 wireless data communications networks are being installed by some of the leading electric utilities in the United States.

For example, a very large Part 15 wireless data communications network is being installed by Southern California Edison (SCE) across much of its very large service territory. When complete, SCE's network will consist of approximately 30,000 packet radios. The primary purpose of the Part 15 radio network is to provide the communications infrastructure for a program