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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
RM-8013

COMMENTS OF
SOUTHWESTERN BELL MOBILE SYSTEMS, INC.

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TABLE OF CONTENTS

	<u>Page</u>
I- SUMMARY AND INTRODUCTION.....	1
II- SBMS' REVISED ALLOCATION SCHEME.....	3
III- SBMS' REVISED PROPOSAL WILL PROMOTE ESTABLISHED COMMISSION POLICY GOALS FOR LMS.....	5
A. Efficient Use of Spectrum.....	6
B. Pro-Competitive Market Structure.....	7
C. Non-Voice Service.....	8
IV- THE FEASIBILITY OF SBMS' REVISED PROPOSAL HAS BEEN INDEPENDENTLY CONFIRMED.....	10
A. Wideband LMS Spectrum Can Be Shared.....	11
B. An Increase In Bandwidth Yields No Significant Increase In System Efficiency.....	12
V- TELETRAC'S REVISED PROPOSAL SHOULD BE REJECTED.....	13
A. Teletrac's Revised Plan Is Designed To Preclude Competition And Assure Clear Market Dominance For Itself.....	14
B. Teletrac's Revised Allocation Plan Simply Will Not Work.....	17
C. Teletrac's "Emergency Voice" Service Raises Serious Questions About Its Revised Proposal...	19
VI- CONCLUSION.....	20

LIST OF EXHIBITS

Exhibit A	SBMS Recommended Spectrum Allocation
Exhibit B	Declaration of B. Keith Rainer

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SOUTHWESTERN BELL MOBILE SYSTEMS, INC.

Southwestern Bell Mobile Systems, Inc. ("SBMS"), by its attorneys and in accordance with Public Notice, DA 94-129, released February 9, 1994 and the Order in PR Docket No. 93-61, DA 94-178, released February 25, 1994, hereby comments on written statements submitted by itself, Pacific Teletrac ("Teletrac") and MobileVision, L.P. ("MobileVision"), each of which summarizes ex parte presentations these parties recently made to the Commission in the above-captioned proceeding. In these comments, SBMS analyzes all issues raised by the recent presentations and submissions.^{1/}

I- SUMMARY AND INTRODUCTION

In its own ex parte presentations, SBMS slightly revised its existing spectrum allocation proposal for the purpose of accommodating incumbent AVM licensees without disturbing other

^{1/} In accordance with the Order, supra at ¶ 4, SBMS will comment on technical and other issues raised by the ex parte presentations and submissions.

aspects of its original scheme designed to enhance spectral efficiency and encourage competition. In these comments, SBMS outlines its revised proposal and demonstrates how it conforms with and promotes stated Commission policy objectives for the emerging LMS.

While retaining the concept of four separate wideband licensees per service area, SBMS now proposes to shift their respective assignments of 4 MHz each to a position two megahertz higher in the 900 MHz band. As a result, wideband operators will be licensed under the SBMS proposal at 906-910 MHz, 910-914 MHz, 916-920 MHz, and 920-924 MHz. This modest adjustment's purpose is to allow implementation of the SBMS market structure without any need for incumbents like MobileVision or Teletrac to modify their existing or proposed frequency configurations.

In sharp contrast to the limited revision SBMS made to its proposal, Teletrac completely revamped its previously-stated position on wideband AVM spectrum allocation while introducing novel licensing requirements unrelated to any objective or rationale previously advocated in this proceeding. Teletrac's abrupt departure from its earlier proposal is hardly innocuous; as shown below, the new allocation and attendant conditions are specifically designed to accord Teletrac an unassailable headstart in providing wideband AVM. In addition, the revised proposal intimates that the AVM Teletrac intends to provide will involve a significant voice component. This attempt to impede competition

while transforming AVM into a voice service is inimical to the Commission's avowed public policy objectives for AVM.

II- SBMS' REVISED ALLOCATION SCHEME

Originally, SBMS proposed allocating discrete spectrum to both narrowband and wideband LMS systems to eliminate potential electrical interference between such carriers. SBMS further advocated licensing at least four exclusive (as to other wideband and narrowband LMS operators) 4 Mhz wideband assignments per service area, as follows: 904-908 MHz (Wide Band A), 908-912 MHz (Wide Band B), 918-922 MHz (Wide Band C) and 922-926 MHz (Wide Band D).

To encourage spectrum efficiency, SBMS proposed assigning separate spectrum for 250 KHz forward link frequencies associated with wideband operations outside 904-912 and 918-926 MHz, deployed toward the edges of the entire 26 MHz LMS band. As an alternative next-best forward link proposal, SBMS suggested that each wideband licensee's forward links be located within its exclusive 4 MHz assignment. SBMS also advocated that the same MSA and RSA market boundaries used to demarcate market boundaries in the domestic public cellular radio service be adopted by the LMS.

In its ex parte presentations and associated written statements, SBMS partially revised its wideband licensing and allocation scheme for LMS to account for comments in this proceeding and for additional technical research undertaken at

SBMS' behest.^{2/} Specifically, SBMS now proposes to shift the four exclusive 4 MHz blocks by two megahertz, resulting in wideband assignments at 906-910 MHz (Wide Band A), 910-914 MHz (Wide Band B), 916-920 MHz (Wide Band C) and 920-924 MHz (Wide Band D). This shift will obviate the need to compel the few wideband licensees to modify their respective frequency assignments.^{3/}

Notwithstanding this two megahertz shift, SBMS continues to urge deploying the 250 KHz forward links of each licensee in separate spectrum at the band edges. The revised SBMS proposal, however, will affect the bandwidth that can be allocated to narrow-band operators, although the total spectrum SBMS proposes to devote to narrowband services will remain unchanged.

In its written statement dated February 7, 1994, SBMS provided a revised chart depicting the changes it was proposing to its original allocation proposal as those changes relate to division of spectrum.^{4/} The chart demonstrated how the revised proposal will accommodate incumbent wideband licensees. The statement and chart also reflected SBMS' belief that its revised LMS system will be able to coexist with the 902-928 MHz band's primary users and with

^{2/} Prior to initiating this research, other parties active in the instant rulemaking were asked to co-sponsor the subject study, which is described below in detail. This offer was uniformly rejected.

^{3/} Adoption of SBMS' original proposal would require Teletrac (center wide-band frequency at 908 MHz), MobileVision (center wide-band frequency at 922 MHz) and Pinpoint (also center wide band frequency at 922 MHz) to modify the frequency configuration of their respective systems.

^{4/} The referenced chart is attached hereto as Exhibit A.

Part 15 devices that currently occupy that band.

SBMS advocates adopting MSA and RSA service area boundaries for LMS licensing purposes. While SBMS' recent ex parte presentations and statements indicate that Teletrac's alternate BTA boundary proposal is a tolerable second choice, several persuasive factors continue to convince SBMS that an MSA/RSA framework will ultimately prove superior.

First, the Commission already has experience in using MSA/RSA boundaries in licensing cellular systems and that experience is generally viewed as favorable. Second, BTA/MTA boundaries established for PCS do not coincide with cellular service areas, creating problems for cellular entities aspiring to engage in LMS. Finally, MSA and RSA boundaries are widely known and easily ascertainable; no private party or entity has ever attempted to control dissemination of maps or listings which depict or define these areas.^{5/}

Based on these considerations, SBMS concludes that MSA/RSA definitions represent the most efficient and practical market boundaries for LMS systems.

**III- SBMS' REVISED PROPOSAL WILL PROMOTE
ESTABLISHED COMMISSION POLICY GOALS FOR LMS**

The Notice of Proposed Rulemaking ("NPRM") in this proceeding makes plain that the Commission has already established several

^{5/} See, "PCIA, Rand McNally Settle Out-of-Court On Use Of BTA/MTA Listings," Washington Telecom Week, February 18, 1994, at 2-3.

well-defined policy objectives for LMS.^{6/} Specifically, the NPRM underscores that LMS must be provided in a spectrally efficient manner within a competitive market structure. Further, the NPRM emphasizes that LMS should be a non-voice service dedicated exclusively to locating and monitoring objects, animate and inanimate. The SBMS proposal, as revised, will satisfy and enhance these specific policy objectives that already bear the Commission's imprimatur.

A. Efficient Use of Spectrum

Concern with spectral efficiency is apparent at several junctures in the NPRM. Among the most prominent is the discussion of spectrum allocation for wideband systems.^{7/} Here, the Commission rejects the notion of assigning each wideband licensee the full eight megahertz in the 904-12 and 918-26 MHz bands and instead endorses a "flexible approach" to "promote efficient spectrum use."^{8/}

As demonstrated by its revised proposal, SBMS is the most consistent advocate of flexibility among the parties in this proceeding; similarly, its revised plan will best serve the goal of efficient spectrum use. Thus, although the SBMS proposal prudently limits bandwidth available to individual licensees, the 4 MHz block is sufficient to provide robust and accurate LMS. SBMS

^{6/} See Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems (Notice of Proposed Rulemaking in PR Docket No. 93-61), 8 FCC Rcd 2502 (1993).

^{7/} Id., 8 FCC Rcd at 2505.

^{8/} Id.

also advocates adjacent channel assignments, which will permit no fewer than four licensees per market and will ensure that the allocated spectrum can be intensively used, rather than warehoused or allowed to lay fallow. For this reason, SBMS shifted its proposed wideband allocation scheme by two full megahertz so that no disruption would befall incumbents, as Exhibit A hereto demonstrates.^{9/}

B. Pro-Competitive Market Structure

Regarding the optimal market structure for LMS, the NPRM stresses the need for "a competitive . . . environment in which [LMS] systems can continue to develop."^{10/} By proposing 4 MHz wideband blocks and adjacent channel assignments, SBMS provides a structure that, by design, will maximize the number of carriers in a market. The more sellers in a market, the greater the degree of rivalry that will occur in terms of price, quality and product innovation. Accordingly, the SBMS proposal, if adopted, will promote the Commission's goal of a competitive environment for LMS.

No other ex parte commentator has presented an allocation scheme that is even remotely as pro-competitive as SBMS' proposal. MobileVision rigidly limits the number of wideband licensees per

^{9/} As discussed in detail below, SBMS commissioned the Mobile and Portable Radio Research Group of Virginia Tech (MPRG) to investigate issues relating to spectrum sharing and interference among AVM systems in the 902-928 MHz frequency bands. MPRG's interim report to SBMS-- which was presented to the Commission with SBMS' written ex parte statement dated February 2, 1994-- supports the feasibility and pro-spectral efficiency characteristics of the revised SBMS proposal.

^{10/} NPRM, 8 FCC Rcd at 2503 (emphasis added).

market to two. Although Teletrac now advocates two licensees per market with possible subsequent sharing, Exhibit B hereto demonstrates that this proposal, in fact, compels the seemingly rival licensees to deploy virtually identical LMS technology over indistinguishable network facilities-- constraints that will eradicate any benefits this imperfectly competitive market structure might somehow produce.^{11/} Finally, the self-avowed sharing proposal of Pinpoint Communications, Inc. is precluded by the exaggerated operating requirements attending its own LMS system.

C. Non-Voice Service

The NPRM unambiguously characterizes LMS as a non-voice service, and with good reason. Wireless voice services are numerous and expanding. Aside from cellular and conventional mobile telephone service, consumers can select from conventional SMR, ESMR, and 220 MHz SMR; PCS, mobile satellite and other satellite-based voice services are anticipated in the near-term. A proposal to use 28 GHz spectrum to provide, inter alia, voice

^{11/} See Supplement To Reply Comments of Southwestern Bell Mobile Systems, Inc. ("Competition In Wideband Location Monitoring Services," by Leland L. Johnson), filed October 15, 1993. Therein, Dr. Johnson demonstrates that the competitive model described by Richard Schmalensee and William E. Taylor ("The Economics of Co-channel Separation for Wideband Pulse Ranging Location Monitoring Systems") on behalf of Teletrac assumed (albeit incorrectly) that LMS competitors would all have identical facilities, costs, technology, experience, etc. As Dr. Johnson concludes (at 8), "[b]y assuming away all . . . differences among firms, and the source of potential competitive benefits to society, Schmalensee and Taylor necessarily are left with only the downside of competitive entry." Stated differently, if competitors in a market are nothing more than clones, no competitive benefits will be realized.

service is pending before the Commission. Considering this profusion of voice-based services, transforming LMS into another such service appears neither warranted nor consistent with the Commission's definition of LMS as "[t]he use of non-voice signalling methods from and to radio units to make known the location of such units."^{12/}

SBMS' revised proposal adheres most closely to the Commission's original intent in defining LMS as a non-voice service. In its initial comments in this proceeding, SBMS proposed a limited expansion of the definition cited above to include communication/interrogation of radio units with known locations to facilitate monitoring of security systems, industrial appliances, vending machines, pipelines, storage terminals, etc. Even under this expanded definition, however, LMS unambiguously remains a non-voice service.

The other parties' intentions regarding LMS voice service, by contrast, invoke conjecture. Teletrac boldly proclaims that LMS licensees should be able to offer real time voice transmissions as a component of emergency roadside or personal services. MobileVision has also urged that LMS incorporate "unrestricted voice and high speed data capability to meet service needs."^{13/}

Because these proposals apparently provide for unconstrained two-way voice and dispatch communications, they should be rejected

^{12/} NPRM, 8 FCC Rcd at 2503 (emphasis added).

^{13/} Letter to Ralph H. Haller, Chief, Private Radio Bureau by counsel for MobileVision, dated February 1, 1994 (hereinafter "MobileVision February 1, 1994 Letter") at 3.

by the Commission as being directly contrary to the Commission's policy objectives for LMS. To allow LMS licensees to provide voice will fundamentally distort the purpose of LMS, encourage spectrum congestion, and will preclude this service from meeting the need for which it was intended.

IV- THE FEASIBILITY OF SBMS' REVISED PROPOSAL
HAS BEEN INDEPENDENTLY CONFIRMED

In an attempt to derive an objective, independent framework for LMS allocation and licensing, SBMS is sponsoring a technical evaluation of 902-928 MHz and that band's ability to accommodate the various LMS systems and technologies represented by the active participants in this rulemaking proceeding. The technical evaluation is being undertaken by the Mobile and Portable Radio Research Group of Virginia Tech (MPRG).^{14/}

After discussions with SBMS in October 1993, MPRG embarked on a four phase study to investigate spectrum sharing and inter-system interference in the 902-928 MHz frequency bands.^{15/} The first

^{14/} MPRG was founded in 1990 by Theodore S. Rappaport, an associate professor at Virginia Tech, to conduct research in emerging wireless technologies. MPRG now comprises several Virginia Tech faculty members and over 30 graduate students. Among other activities, MPRG conducts specific funded- research for corporate and institutional sponsors-- of which there are currently 14, including SBMS, Teletrac and the Advanced Research Projects Agency. MPRG recently received two National Science Foundation awards. In recent years, MPRG has undertaken research in the following LMS-related areas: measurement, simulation and prediction of the mobile communications channel; analysis and simulation of spread spectrum systems; and advanced techniques for interference rejection.

^{15/} As noted earlier, MPRG and SBMS asked Teletrac, MobileVision, Pinpoint and the Part 15 Coalition to join in sponsoring the study.
(continued...)

phase, which will be completed on or about July 1994, analyzes tradeoffs between LMS system performance and bandwidth. The subsequent phases, which are to proceed simultaneously and entail an additional ten months, will investigate and evaluate alternative techniques for spectrum sharing among LMS systems, proposed standards for LMS operation, and interference resistance among rival LMS technologies.

MPRG has provided an interim report to SBMS concerning its first phase analysis. The report's findings have been disclosed in several ex parte presentations made by SBMS and SBMS has submitted the report for the record in this proceeding. As discussed below, the report confirms essential principles animating SBMS' revised proposal, namely:

- LMS licensees can share wideband spectrum through adjacent channel assignments; and
- Increased bandwidth achieves no significant increase in an LMS system's overall efficiency.

These findings are discussed below.

A. Wideband LMS Spectrum Can Be Shared

While finding that direct overlay of LMS systems (utilizing TDMA or CDMA technology) is not technically feasible, MPRG determined that locating systems on adjacent channels with minimal

^{15/}(...continued)

All declined. As a result, SBMS has borne sole responsibility for funding the research and presenting preliminary results of MPRG's work to the Commission.

interference should be possible.^{16/} MPRG also found that the stated bandwidth requirements for all LMS systems it studied were excessively pessimistic. According to MPRG, reasonably precise pulse shaping techniques can be used to realize LMS bandwidths no more than twice the chipping rate, thus allowing one LMS system to operate on a channel directly adjacent to a second system. Furthermore, MPRG concluded that the overlap of sidelobes of LMS systems licensed on adjacent spectrum will produce minimal interference.^{17/} As a result, MPRG has concluded that, to the extent of this overlap of sidelobes, some spectrum sharing is feasible.

B. An Increase In Bandwidth Yields No Significant Increase In System Efficiency

Contrary to the assertions of Teletrac's "experts," MPRG concluded that the overall information carrying efficiency of an LMS system will not significantly increase with bandwidth.^{18/} Although the efficiency of determining a pulse time of arrival may improve with bandwidth, MPRG determined that "there is no such relationship for the messaging capabilities of the system."^{19/} And increasing bandwidth will have only a modest effect on the

^{16/} See MPRG Report at 6-7.

^{17/} Id.

^{18/} Id. at 8.

^{19/} Id.

capability of LMS systems to resolve and reject multipath propagation.^{20/}

MPRG determined that techniques which allow purely orthogonal CDMA/FDMA will have a similar effect, increasing the position location capacity of the system but not the overall messaging capacity. For lightly-loaded systems, according to MPRG, CDMA/FDMA technology will modestly reduce interference levels by maintaining full orthogonality between channels. For heavily loaded systems, MPRG concludes that all CDMA systems will exhibit similar capacity.^{21/}

V- TELETRAC'S REVISED PROPOSAL SHOULD BE REJECTED

In an ex parte presentation on January 25, 1994 to the Chief, Private Radio Bureau and his staff, Teletrac advocated an allocation and licensing scheme for wideband LMS that bore little, if any, resemblance to the recommendations that Teletrac had previously advocated so vehemently in this proceeding.^{22/} Indeed,

^{20/} MPRG Report at 8.

^{21/} Id. In view of MPRG's preliminary conclusions, the Commission would be justified in deferring further action in this proceeding until release by MPRG of its final Phase 1 report. MPRG's interim report clearly demonstrates that practical and realistic solutions are possible in this proceeding, but that additional studies (particularly with respect to interference with Part 15 devices) are necessary. Additional studies may fully placate Part 15 advocates and may further confirm the feasibility of SBMS' revised adjacent channel sharing proposal.

^{22/} The ex parte presentation was followed by a letter to Mr. Haller dated January 26, 1994 confirming the views asserted in Teletrac's presentation. Teletrac's revised proposal is referenced herein by citing the letter, which is hereinafter referred to as "Teletrac's January 26 Letter."

the revised proposal has been characterized by one commenting party "as nothing less than astounding" because it diverges so severely from Teletrac's original plan.^{23/}

The abruptness and degree of Teletrac's about-face notwithstanding, its revised plan is fundamentally flawed and, at bottom, appears designed to guarantee Teletrac an outright monopoly or an insurmountable headstart in markets where it has constructed or is constructing wideband systems. Moreover, the proposed sharing scheme is technically unworkable. Finally, Teletrac appears to be arrogating additional spectrum to itself for the sole purpose of providing voice service. For these reasons, the Commission should reject Teletrac's revised proposal.

A. Teletrac's Revised Plan Is Designed To Preclude Competition And Assure Clear Market Dominance For Itself

That Teletrac's revised proposal is motivated by a desire to repress competition while securing overwhelming market dominance for itself is easily demonstrated. Consider the following aspects of the new proposal:

- only one 10 MHz band would now be allocated to wideband LMS; conveniently, the 10 MHz specified coincides precisely with frequencies for which Teletrac has already been licensed;
- the geographic area in which wideband licensees will be entitled to co-channel protection is Rand-McNally Basic Trading Areas ("BTAs"), but licensees currently authorized in a portion of these areas will automatically be authorized to serve the entire BTA;

^{23/} MobileVision February 1, 1994 Letter at 3.

- co-channel protection will be afforded only to the two initial operators who construct and operate "a commercially viable system" as defined by Teletrac, i.e., able to locate vehicles in an area covered by at least 50 per cent of the BTA's population, with 300 feet location accuracy and 90 per cent reliability, and a minimum of 1500 paying units per system; and
- subsequent wideband systems are allowed only if they can prove non-interference to (while agreeing to accept interference from) incumbent licensees.^{24/}

The blatant anti-competitive ramifications of Teletrac's proposal are immediately apparent.

First, under Teletrac's plan, its existing authorizations are immediately transformed into monopoly BTA licenses in each of its licensed areas. Second, entities even considering to compete as the second licensee must first apply for authorization on the 10 MHz specified by Teletrac. Even if these authorizations are granted, MPRG's finding that "direct overlay of AVM systems within the same frequency spectrum is not a viable option" signifies the death knell for competition between twin licensees.^{25/}

Alternatively, as discussed below and in Exhibit B hereto, the two licensees might co-exist, but only if the second licensee utilizes LMS technology nearly identical to and deployed over network facilities virtually indistinguishable from Teletrac's.

^{24/} Teletrac January 26, 1994 Letter at 1-3.

^{25/} MPRG interim report at 6. For this reason, the requirement that initial licensees satisfy Teletrac's definition of a "commercially viable system" is nothing more than a smoke screen, designed to obscure Teletrac's otherwise transparent attempt to impose a regulatory structure dedicated exclusively to its narrow self-interest.

SBMS has already demonstrated that when firms competing in a market are nothing more than clones (as they will be here), the benefits of competition evaporate.^{26/} If meaningful competition between two LMS licensees in the Teletrac proposal is remote, then the prospect of such competition among three or more licensees is entirely non-existent. These licensees would also be consigned to essentially the same technology and network facilities selected by Teletrac but would have to demonstrate non-interference to incumbents (including Teletrac) who, inequitably, would be free to operate their systems so as to degrade the service provided by these third and fourth tier rivals.^{27/}

Summarily stated, the revised Teletrac proposal is nothing more than a stratagem designed to secure for itself unassailable market dominance while precluding any prospect of meaningful economic competition within the realm of wideband LMS. The Commission should not countenance this ploy.

^{26/} See text at note 11, supra.

^{27/} Notwithstanding duopoly licensing, the market for cellular service lacks even superficial resemblance to the scheme Teletrac now proposes for wideband LMS. In MSAs, competing cellular carriers share neither network transmission nor switching facilities; in RSAs, only switching equipment may be shared by rival licensees. Moreover, equipment vendors offer different digital technology and co-market licensees have no reason (and are by no means compelled) to select the same digital system as their rival. Finally, a thriving resale market has developed in cellular, while LMS resale would be unnecessary and illogical under Teletrac's contrived proposal. For these reasons, the cellular market exhibits multiple hallmarks of competition while LMS, at least in a Teletrac world, will not.

B. Teletrac's Revised Allocation Plan Simply Will Not Work

Under Teletrac's recent proposal, the 10 MHz of wideband LMS spectrum would be divided as follows:

- Two forward links, each 1.5 MHz wide (one link for each wideband system);
- Two narrowband forward links, each 250 KHz wide (one link for each wide band system);^{28/}
- One 6.5 MHz return link to be shared by both systems in each market.^{29/}

This scheme was analyzed by Mr. Keith Rainer of Southwestern Bell Technology Resources whose Declaration with respect thereto is included herewith as Exhibit B. According to Mr. Rainer, Teletrac's sharing proposal is unworkable, inefficient and unreliable, unless two virtually identical LMS technologies are deployed over nearly identical network topologies.^{30/} This is, Rainer explains, because rival wideband LMS technologies and

^{28/} SBMS agrees that 250 KHz forward links are essential to efficient LMS operation and that the narrowband forward link channels should be placed at edges of the 902-928 MHz band to mitigate possible interference to narrowband and wideband systems.

^{29/} Teletrac January 26, 1994 Letter at Attachment.

^{30/} Declaration of Keith Rainer, Exhibit B hereto at para. 12. While Teletrac's sharing proposal is unworkable, aspects of the power limitations associated therewith are acceptable to SBMS to minimize potential interference to other co-channel systems like ISM and Part 15 devices. Restricting a mobile unit's transmit power to a maximum of 10 watts ERP for a maximum duration of one second and limiting a base station to a maximum of 500 watts ERP for a continuous duration are reasonable. Systems that propose to utilize mobile radio with peak ERP's exceeding 10 watts (e.g., Pinpoint, which proposes peak ERP of 40 watts) have the potential for significantly greater interference with other co-channel LMS operators and Part 15 users. If the LMS band is to be shared with such operators, mobile unit transmit power must be constrained. In addition, base stations must be required to operate within the 250 KHz allocated to narrowband forward links. Id.

systems utilize different bandwidths, synchronization, power levels, protocols, and network topologies.^{31/}

Mr. Rainer further explains that the 1.5 MHz forward link channels proposed by Teletrac are unnecessary. Neither the SBMS Quiktrak system nor any other operational or planned LMS system with which SBMS is familiar has any need for 1.5 MHz forward channels. If these channels are to be used for a unique service developed by Teletrac, then the 1.5 MHz assigned to the second operator in a market will lie fallow.

Mr. Rainer also demonstrates that time-sharing the 6.5 MHz wideband reverse link as proposed by Teletrac is unworkable.^{32/} For two licensees to make efficient use of the available spectrum and to operate reliably, the LMS technologies and network layout of each would require a high degree of similarity. The more dissimilar the technologies, the more spectral inefficiency Teletrac's proposal will create.

Mr. Rainer observes that Teletrac's revised proposal is internally inconsistent, because it proposes to limit licensee housekeeping functions to only one per cent of channel capacity, while its own system consumes five per cent of capacity for these functions. Moreover, Teletrac's system requires housekeeping

^{31/} Exhibit B hereto at 1.

^{32/} Mr. Rainer suggests that Teletrac's original proposal in this proceeding was somewhat misleading because it claimed that the wideband portion of its AVM system required no less than 8 MHz. That its current wideband system uses only 4 MHz at the same time that Teletrac has been asserting a minimum need of 8 MHz and is now proposing 10 MHz is ironic indeed.

functions that are no longer technically necessary and which are used by no other existing or developing LMS systems, including the SBMS Quiktrak system.

C. Teletrac's "Emergency Voice" Service Raises Serious Questions About Its Revised Proposal

Teletrac claims that radiolocation services must also offer real time voice transmissions in connection with emergency roadside or personal safety services.^{33/} SBMS strongly disagrees. Unless the Commission is willing to allow LMS to be transformed into an essentially voice-based service, Teletrac should be precluded from using its allocations for general two-way or dispatch communications.

In any event, Teletrac's proposal for "Emergency Voice" service is internally inconsistent. At one point, Teletrac suggests that it will attempt to compute the location of customers in distress based on "[r]eal time, two-way voice" transmissions.^{34/} At another juncture, Teletrac claims that, by "pressing a button," such a customer could signal its location to a licensee's network control center which would then inquire, by voice, as to the customer's physical condition, etc. ^{35/}

Either arrangement implies that Teletrac's system is locating mobile transponders within the 1.5 MHz forward link assignment while providing voice service in the same channel. As Mr. Rainer

^{33/} Teletrac January 26, 1994 Letter at 3.

^{34/} Id. at 4.

^{35/} Id. at 3.

notes in Exhibit B hereto, this is grossly inefficient. Emergency voice can be provided in a wideband operator's forward link channels which occupy only 250 KHz, clearly a more efficient use of spectrum.^{36/}

The inconsistencies and inefficiencies associated with Teletrac's voice proposal are sufficient to justify its rejection. Moreover, as previously demonstrated, injection of voice into LMS is fundamentally at odds with the Commission's original definition and conception of LMS, as well as the numerous and continually increasing mobile voice services available to the public.^{37/}

VI- CONCLUSION

The revised SBMS allocation and licensing proposal for wideband LMS is consistent with and will emphatically promote stated Commission policy goals for this service. Teletrac's revised proposal, by contrast, will not. Accordingly, the Commission should adopt permanent licensing rules for LMS that are consistent with SBMS's instant comments and with its other

^{36/} Teletrac is apparently proposing two 1.5 MHz forward links for the specific purpose of providing voice, while confining the wideband return link to 6.5 MHz. This new configuration casts doubt on whether Teletrac's original proposal, which adamantly claimed that 8 MHz was the minimum requirement for a reverse link, was made in good faith.

^{37/} Assuming arguendo that a convincing policy rationale for LMS-based emergency voice service could be articulated, allocating three MHz of virgin spectrum for this purpose, as Teletrac has apparently proposed, would still be highly inappropriate. SBMS has demonstrated that the voice service contemplated by Teletrac can be efficiently and competently provided within the 250 KHz already designated for forward links.

submissions for the record in this proceeding.

Respectfully submitted,

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EXHIBIT A

SBMS RECOMMENDED SPECTRUM ALLOCATION

Recommended Spectrum Allocation

