

**EXHIBIT B**

**DECLARATION OF B. KEITH RAINER**

DECLARATION OF B. KEITH RAINER REGARDING THE  
ALTERNATIVE AVM ALLOCATION PROPOSAL SUBMITTED TO  
THE FEDERAL COMMUNICATIONS COMMISSION BY PACTEL TELETRAC

I, B. Keith Rainer hereby certify:

1. I am currently an employee of Southwestern Bell Technology Resources where I have been a Member of the Technical Staff since 1990. My full qualifications have already been provided in this proceeding, most recently in the Reply Comments of Southwestern Bell Mobile Systems, Inc. filed on July 29, 1993.

2. The following comments are provided in response to the revised allocation proposal submitted to the Federal Communications Commission on January 26, 1994 by Pactel Teletrac ("Teletrac").

3. I have reviewed the alternative technical proposal submitted by Teletrac (hereinafter the "Teletrac Letter"). Teletrac's proposal focuses on three main issues: rules for sharing the band; co-channel protection; and emergency voice. Although a detailed technical response to Teletrac's ideas would require a more detailed description of Teletrac's proposals, I offer several observations regarding the new Teletrac scheme.

4. In general, the FDMA and air time sharing scheme proposed by Teletrac is unworkable, inefficient, and unreliable unless two nearly identical LMS technologies are deployed over nearly identical network topologies. This is due to the differences in

bandwidth, synchronization, power levels, protocols, and network topologies used by candidate LMS technologies and systems.

5. Teletrac proposes that a single 6.5 MHz channel be allocated for the wide band reverse communication link and that this channel be time-shared between two service providers. Time-sharing of a 6.5 MHz wide band reverse link would be unworkable. For two systems to make efficient use of the available spectrum and to reliably share the same spectrum, the technologies used and the network layout employed in the two systems would need to be nearly identical.<sup>1/</sup>

6. Under Teletrac's proposal, the more dissimilar the technologies of the two sharing systems are, the more the allocated spectrum will be used inefficiently. For example, Teletrac states that the cumulative housekeeping functions of each system must not exceed 1% of the total system time averaged over one minute. See Attachment to Teletrac Letter. However, Teletrac proposes that 50 milliseconds (ms) out of each second would be used for each wide band system's calibration. That calibration period is undoubtedly necessary for operation of the Teletrac system, but not for other LMS systems. The SBMS Quiktrak technology, for one, does not

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<sup>1/</sup> With this understanding, Teletrac's suggestion that subsequent market entrants could later be licensed to share spectrum on a non-interfering basis is ludicrous.

require a periodic calibration period using 50 ms of air time. Therefore, from the SBMS perspective alone, imposing Teletrac's 50 ms calibration period on two licensees sharing spectrum constitutes a waste of spectrum.

7. Moreover, Teletrac's proposal is inconsistent. Its 50 ms calibration period would constitute 5%, not 1%, of the air time available to the two systems. Further, the time slot durations proposed by Teletrac are incompatible with the SBMS LMS system synchronization. Thus, guard times would have to be used to avoid harmful interference between systems resulting in an additional spectrum inefficiency. Furthermore, protocol, power, and network topology incompatibilities between the two systems sharing spectrum, as described in the Teletrac proposal, would result in further system inefficiencies and effect overall system reliability.

8. Additionally, if Teletrac's latest proposal is to be taken seriously, then it is clear that Teletrac has been less than forthright regarding its system's requirement for 8 MHz of spectrum for capacity. With Teletrac now proposing to share a 6.5 MHz wide band reverse link with another licensee, it is obvious that Teletrac's previous claim that the wide band portion of its LMS system required 8 MHz of spectrum has been inaccurate at best.

9. Teletrac suggests that two 1.5 MHz forward link channels be allocated (one for each service provider). There is no need for 1.5 MHz forward link channels. Neither the SBMS Quiktrak system nor any other operational or planned LMS system with which SBMS is familiar has any need for a 1.5 MHz forward link channel. Moreover, Teletrac's proposed use for the channels is unclear. It can only be assumed that this spectrum provision is being offered to support a development that Teletrac has planned that is unique to its LMS technology. Based on its comments about an "emergency voice" LMS feature, it may be assumed that these forward links would be used for that service.<sup>2/</sup> Unless the second system in a Teletrac market also requires a 1.5 MHz forward link (i.e. another Teletrac-like system), 1.5 MHz of spectrum will be left fallow.

10. Teletrac acknowledges that 250 kHz forward links are essential to efficient AVM operation and should be allocated for each LMS system's narrow band forward (from base station to mobile) links. SBMS advocated this idea in its original Comments. The location of these forward links in spectrum separate from the wide band reverse (from mobile to base station) link channels and their placement at the edges of the 902-928 MHz band to mitigate possible

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<sup>2/</sup> Unless voice transmissions are used to compute location, an emergency voice feature could be provided by a wide band provider on its forward link channels which are only 250 kHz. Comparatively, the emergency voice service described by Teletrac is grossly inefficient. It would locate mobile transponders and provide voice services within 1.5 MHz of spectrum.

interference to narrow band AVM systems and wide band LMS systems also matches SBMS' original proposal.

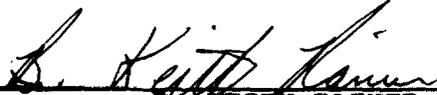
11. Teletrac suggests that the Commission adopt a minimum coverage requirement as a condition of the award and retention of a commercial license, but SBMS proposes more stringent, and thus more effective, requirements. LMS systems should be able to locate mobile transponders on 90% of the location attempts within 300 feet of the actual location of the mobile transponder over 95% (instead of the 50% proposed by Teletrac) of the licensee's service area. These requirements should limit speculative applications.

12. Finally, power limitations are essential to the reliable operation of LMS systems and any sharing scheme proposed among LMS operators. To minimize any potential interference to other co-channel systems (Part 15, ISM, etc.) power limitations are necessary. Specifically, a mobile unit's transmit power should be limited to a maximum of 10 watts ERP for a maximum duration of 1 second and LMS base stations should be limited to a maximum of 500 watts ERP for a continuous duration. In addition, the base station must be required to operate within a 250 kHz slot specifically allocated to narrow band forward links.

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I hereby certify under penalty of perjury that the above statements are true and correct to the best of my knowledge, information and belief.

Signed and dated this 24 day of February, 1994.

  
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B. KEITH RAINER