Kathleen Q. Abernathy
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January 26, 1994

EX PARTE

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

RE: PR Docket 93-61 - Automatic Vehicle Monitoring Systems

Dear Mr. Caton:

On Tuesday, January 25, 1994, Bill Goshay of PacTel Teletrac and I met with Ralph Haller, Chief, Private Radio Bureau, and his staff regarding the Automatic Vehicle Monitoring issues being addressed in the proceeding indicated above. We discussed the information set forth in the attached documents. Please associate this material with the above-referenced proceeding.

Two copies of this notice were submitted to the Secretary of the FCC in accordance with Section 1.1206(a)(1) of the Commission's Rules.

Please stamp and return the provided copy to confirm your receipt. I can be contacted at 202-383-6437 should you have any questions or require additional information concerning this matter.

Sincerely,

Kathleen Q. Abernathy
Managing Director

cc: Ralph Haller

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John R. Lister
President and
Co-Chief Executive Officer

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January 26, 1994

Ralph A. Haller, Chief
Private Radio Bureau
Federal Communications Commission
2025 M Street, N.W., Room 5002
Washington, DC 20554

NPRM - Docket No. 93-61

Dear Mr. Haller:

PacTel Teletrac is the nation's leading provider of vehicle location services and has been an active participant in the above-referenced proceeding. We are aware that numerous, difficult issues have been raised by commenting parties, with particular focus on the need to allocate the spectrum to the various users fairly and equitable.

Consistent with this public policy goal, and in an effort to move the proceeding forward to ensure the public benefits from a multiplicity of service providers, we offer the following technical proposal for the 902-928 MHz band. This sharing proposal decreases the spectrum allocation intended for wide area multilateration systems from 16 MHz to 10 MHz. Instead, provisions have been made to allow two systems to share spectrum in a service area. This proposal also allocates approximately 16 MHz of spectrum to AVI providers and improves the environment for Part 15 devices.

I. Rules for Sharing the Band

Issue: How can multiple wideband multilateration systems operate in the same spectrum absent the adoption of sharing rules by the FCC? Teletrac believes the answer is no. The radiolocation industry would continue to be stymied, as it is today, absent permanent rules. In fact, conditions could be worse because at least today the same system can be built in every city in the U.S. However, under a sharing regime with no rules, a system might be built in New Jersey requiring a certain protocol, but a system built in New York would require an entirely different protocol. Under this scenario, a vehicle from Washington D.C. could not receive service when traveling to New York. System operators would have to spend substantial sums to constantly change technology to conform to the protocols in different areas. Public benefit would suffer because user equipment could not be produced in sufficient quantities to keep costs low.

SOLUTION: Adopt sharing rules at the same time that the final rules are issued. Teletrac engineers have worked to find a way to permit two wideband systems to share 10 MHz with reasonable degradation of service quality. An essential part of these rules is enough forward link bandwidth to reliably contact vehicles and to provide for future services. Therefore, forward link bandwidth needs to be 250 KHz for each system for a total of 500 KHz. These forward links outside the band offset some of the degradation from having to share 902-912 MHz. (Forward links totalling 500 KHz for 912-928 MHz would be located at 902-902.5 MHz; this spectrum could not be used by the two systems sharing 902-912 MHz). A forward link is also available within the return link spectrum. These proposed sharing rules are attached.

A third system is not provided for in Teletrac's rules given technical constraints. Teletrac engineers believe that if three or more wideband multilateration systems share 902-912 MHz, there would be substantial degradation in service. Collisions among signals transmitted by mobiles being serviced by different systems, as well as "Housekeeping" functions, such as calibration, would degrade service below acceptable quality. These problems would also cause an exponential increase in the number of location "retries", thereby reducing the usable capacity of the spectrum. Additionally, a third system could not use the location sub-segment and the adjacent wideband forward link segment as one contiguous segment. Lastly, the third system would not have access to the forward channel segments because these channels cannot be shared and would have difficulty acquiring equipment that would be compatible with the other two systems.

II. Co-Channel Protection/First two to Construct and Operate

Issue: How to define the co-channel protection area. Presently, wideband systems are licensed by particular transmit sites that have been selected by a system operator.

SOLUTION: Use Rand McNally Basic Trading Areas (BTAs) as the service area. The significant advantage is certainty of the protected area. In addition, BTAs are sufficiently large areas, basically covering a metropolitan area. We request that current licenses be automatically converted to BTAs (and to other changes required by the final rules).

Issue: The test for measuring who constructs and operates first must be sufficiently strict to discourage speculation by companies who are not serious about immediately operating a commercially viable radiolocation system, yet sufficiently easy so that companies with a commercially viable system are not deterred. Companies that are not serious would probably fall into two categories: "greenmailers" and those who are at the pilot program stage. "Greenmailers" are those who would build a minimal system, maybe putting one or two mobiles on the system in order to force those who come into the market after them to pay substantially for getting the greenmailer out of the market. Greenmailers typically do not intend to operate in the market.

Companies that some day intend to operate a commercially viable system but are presently only in the pilot stage should also be precluded from qualifying for co-channel protection until they are ready to deploy and operate a commercially viable system. This is because some companies might be in the pilot stage for a very long time, and indeed may never get to the commercial stage; or their technology could change prior to deploying a commercially viable system. We have seen examples of that in the radiolocation industry. For example, a foreign company began a pilot program in the late 1980s. We understand that its commercial operations are still in the pilot program phase. Teletrac also started with a pilot program in 1987. That system could never have been commercially deployed. It was not until 1991 that Teletrac had a commercially viable system.

SOLUTION: Have a minimum coverage area requirement. A company that intends to deploy a commercially viable service should be able to locate vehicles in an area covered by at least 50% of the population of the area (BTA), with a location accuracy of 300 feet and 90% reliability. Also, since the minimum coverage test is extremely easy to satisfy, there should be a requirement for at least 1500 paying units on the system. This is the current FCC loading requirement for wideband systems. Under these tests it is irrelevant when an entity is granted a license by the FCC.

Issue: How to determine the status of other systems entering the market after two systems have constructed and satisfied the operating tests for co-channel protection.

SOLUTION: Subsequent systems (after two systems have been granted co-channel protection) should be permitted to operate only as long as they do not cause harmful interference to systems already providing commercial services. These systems must tolerate interference from the systems already in commercial operation. Furthermore, before any "additional" system is granted a license to enter the market, the proponent must show that the new system will not cause harmful interference.

III. Emergency Voice

Radiolocation services need the authority for real time voice transmissions in connection with emergency roadside or personal safety services. These services would not compete with cellular or PCS because the customer would not be able to make calls at will. The call could only go to a predetermined service provider. For example, a customer who has had an automobile accident would press a button which would send a signal to a service provider's network control center. The customer's vehicle would be located on a map, and a control center operator would (by using voice) be able to ascertain whether the customer was injured and required an ambulance. The customer would be informed that help is on the way. This gives the customer the comfort needed in emergency situations, and also gives the police (and ambulance services) comfort that the customer really is in need of emergency assistance, and that the button was not pushed accidently.

In summary, Teletrac strongly recommends that sharing rules be issued at the same time that the final rules are published. For the "first to construct and operate" test, Teletrac supports BTAs, and proposes coverage requirements (50% of population, 300 feet accuracy with 90% reliability) and 1500 paying mobile units. Subsequent systems must operate on a non-interference basis to those systems awarded co-channel protection (and must prove non-interference before being granted a license). Real time, two-way voice should be permitted for locations in connection with emergency roadside or personal safety incidents.

We look forward to discussing Teletrac's comments on sharing and co-channel protection with you in more detail.

Thank you for your consideration of our proposal.

Yours truly,

John Lister

John Lister
President

POWER LIMITATIONS

Transmitter Station	Maximum Power	Maximum Duration
Mobile *	10 Watts ERP	1 Second
Base Station	500 Watts ERP	Continuous
"Control Stations"	10 Watts ERP	1 Second
FXOT	10 Watts ERP Secondary	1 Second

* Except data or emergency voice which can transmit up to 30 seconds if the power is limited to 1 watt ERP.

EMISSIONS

	SUB-SEGMENTS		
	NBFL	WBFL	LOCATION
Emissions			
Pulsed Wideband Spread Spectrum	NONE	Forward Link, Control Stations	Mobile, Calibration Transmitters
Continuous Wideband Spread Spectrum	NONE	Forward Link	Calibration Transmitters (Limited to 3 seconds)
Pulsed Narrowband	Forward Link, Control Stations	Mobiles, Control Stations	Mobiles, Control Stations
Continuous Narrowband	Forward Link	NONE	NONE
Emergency Voice	Mobile, Forward Link	Mobile, Forward Link	Mobile

DEFINITION OF COVERAGE

The area in which the Radio Location System consistently delivers coordinates to a position within 300 feet radius of the actual location of the transceiver. The system must deliver this information for at least 90% of the attempts.

HOW SHARING IS ACCOMPLISHED

- Each first-to-construct system has 100% usage of its forward link segment.
- Each wideband forward link segment is 1.5 MHz wide.
- Narrowband forward link segments are 250 KHz wide.
- Each system shares the return link for mobile to base station transmissions (6.5 MHz).
- Each second is divided into 20 equal 50 ms slots. The first 50 ms slot of every odd second (GPS time) is devoted to system #1 "housekeeping" functions, such as calibration, which require high power, fixed site transmissions inside the shared location sub-segment. The other system may use the time slot for mobile transmissions, but at the risk of suffering interference from the housekeeping functions. In a similar way system #2 uses the first 50 ms of the even seconds (shared with mobile traffic from the first system). Cumulative usage of the housekeeping functions of each system must not exceed 1% of the total time (averaged over any minute).
- Time synchronization is accomplished by using the Global Positioning Satellite system as a time base.

PACTEL TELETRAC PROPOSED TECHNICAL RULES

STATION DEFINITIONS

Mobile -- A transceiver which is either hand held (and complies to safety standards) or installed on an animate or inanimate object (including people).

Control Station -- Similar to a mobile, but for the purpose of receiving and transmitting information to a fleet of vehicles (similar to SMR control stations).

Forward Link -- Signals transmitted to interrogate mobiles and control stations. These stations also transmit outbound ancillary data.

Calibration Transmitters -- Fixed transmitters, located at various points in a coverage area, which are used to calibrate the accuracy of the radio location system.

SPECTRUM UTILIZATION

FREQ	902.0-902.5	902.5-904	904-910.5	910.5-912	924.89-925.14	925.14-925.39
USE	NBFL Upper Segment	WBFL2	LOCATION	WBFL1	NBFL1	NBFL2
B/W	500 KHz	1.5 MHz	6.5 MHz	1.5 MHz	250 KHz	250 KHz

NOTE: If either system does not use a wideband forward link, it has the option of using 8 MHz of contiguous spectrum (LOCATION sub-segment PLUS their appropriate WBFL sub-segment).

Explanation:

NBFL1 is a Narrowband Forward Link for system 1.
WBFL1 is a Wideband Forward Link for system 1.
NBFL2 is a Narrowband Forward Link for system 2.
WBFL2 is a Wideband Forward Link for system 2.