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DEC 19 1994

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use	)	ET Docket No. 94-32

To: The Commission

COMMENTS
OF THE
PERSONAL COMMUNICATIONS INDUSTRY ASSOCIATION

Respectfully submitted,

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SUMMARY

The Personal Communications Industry Association ("PCIA"), pursuant to Section 1.415 of the Commission's Rules, 47 C.F.R. §1.415, respectfully submits its Comments in response to the Notice of Proposed Rule Making issued by the Federal Communications Commission in the above-captioned proceeding.

The private radio user community is now poised to make the next quantum leap in radio technological innovation. Public networks may begin operation, may expand, may increase their sophistication level, may go bankrupt, may increase or decrease their area of coverage, may cut rates or raise rates. Regardless of the direction public systems may take, the ability to build and operate a private radio system must be preserved. The well-engineered private network has, and will continue to have, certain attributes that are not just desirable, but essential.

Members of PCIA's Private Systems Users Alliance has determined that certain types of users have such specialized requirements that it is unlikely that a carrier system could ever serve their needs, regardless of the drop in price of technology. A discussion of such needs and the difficulties involved in obtaining service from commercial carriers are detailed in NABER's Comments in response to the NOI. PCIA/NABER requests that the Commission again review that document. Set forth in these Comments are additional examples from PCIA members representing large users in various industries demonstrating the need for dedicated private system spectrum.

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The Personal Communications Industry Association ("PCIA"), pursuant to Section 1.415 of the Commission's Rules, 47 C.F.R. §1.415, respectfully submits its Comments in response to the Notice of Proposed Rule Making issued by the Federal Communications Commission in the above-captioned proceeding.[1]

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[1] 59 FR 59393 (November 17, 1994). The National Association of Business and Educational Radio, Inc. ("NABER") and PCIA recently announced the decision to merge their two organizations and to operate under the PCIA name as a new legal entity. Pending final legal and regulatory approvals the tow organizations remain separate legal entities. This new PCIA is an international trade association created to represent the interests of both commercial mobile radio service (CMRS) and private mobile radio service (PMRS) users and businesses involved in all facets of the personal communications industry. PCIA's Federation of Councils include: the Paging and Narrowband PCS Alliance, the Broadband PCS Alliance, the Specialized Mobile Radio Alliance, the Site Owners and Managers Association, the Association of Wireless System Integrators, the Association of Communications Technicians, and the Private System Users Alliance. In addition, as the FCC-appointed frequency coordinator for the 450-512 MHz bands in the Business Radio Service, the 800 and 900 MHz Business Pools, 800 MHz General Category frequencies for Business eligibles and conventional SMR systems, and for the 929 MHz paging frequencies, PCIA represents and serves the interests of tens of thousands of licenses.

I. **BACKGROUND**

This proceeding is the Commission's first proceeding to allocate spectrum transferred from Federal Government to private sector use in accordance with the Omnibus Budget Reconciliation Act of 1993. The Commission has now proposed allocations for the 2390-2400 MHz, 2402-2417 MHz and 4660-4685 bands which are now available for transfer from the Federal Government and requested comments on the proposed allocations.

PCIA's Comments will focus on the 2390-2400 MHz band. In its Comments filed in this proceeding on June 15, 1994, NABER had informed the Commission that of the spectrum to be reallocated immediately, this portion of the spectrum would be the most beneficial for the private land mobile services.

II. **COMMENTS**

A. **History Of Private Land Mobile Communications Systems**

Since the first land mobile radios were used by the Detroit Police Department, large private users have traditionally been at the forefront of implementing advanced radio technologies. This has become necessary because new technologies are generally not cost effective for carriers to initially provide. Indeed, the private radio services were created for just this reason.

Single user private systems came first in the evolution of each new radio technology. Eventually, smaller companies who wished to use radio were able to as costs were reduced. However, smaller users generally could not afford their own systems, which led to creation of cooperatives and community repeaters, which were

the first carrier systems. Large users have generally been first with the development and establishment of innovative uses because of their specialized needs, which later become economically feasible for smaller users and were offered by various types of carriers.

The following represents examples (at the time) of innovative uses of radio communications which could not be satisfied by carrier systems when the systems were implemented:

1. Mobile Data, and innovation by Federal Express;

2. An Innovative paging system designed by IBM, which eventually became Ardis;

3. RF links with bar code links to computers for baggage (bag matches for international departures are now FAA mandated) by the airline industry;

4. Remote monitoring by RF by the oil and gas industry. The industry is now performing safety inspections by RF. Further, there are Federal requirements requiring radio systems to respond to emergency situations;[2]

5. Vehicle location systems by the urban mass transit industry;

6. Hand held radios, encryption, digital transmission and mobile video by the public safety industry.

Each of the above-referenced uses of radio communications were first implemented by private users which were unable to obtain the service they needed from carrier-based systems.

At each stage of mobile radio development, the large private user has needed to license spectrum for the advanced technology to build systems which advanced the state of the radio industry. In

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[2] See, 49 C.F.R. Part 191.

each case, the Commission has responded with an allocation of spectrum suitable for the new technological advances. Service in newly allocated frequencies in the 150 MHz, 450 MHz, 800 MHz and 900 MHz was first implemented by large private user systems, with carrier system being implemented only after costs for service became more economical.

In many cases, private radio systems have been implemented because large users could not wait for carrier systems to be developed. In other cases, private radio systems were necessary because the need for emergency use of the system by many large users is contrary to the carrier's operational setup.

B. **User's Need For Additional Private Spectrum In The Future**

The private radio user community is now poised to make the next quantum leap in radio technological innovation. Contrary to the Commission's suggestion in paragraph 16 of the NPRM, "Advanced Private Communications" are **not** being satisfied in other bands. While it is true that private users can receive **some** service from commercial service providers, large users can often **not** receive the service that they need.[3]

As discussed in NABER's Comments in response to the NOI, public networks may begin operation, may expand, may increase their sophistication level, may go bankrupt, may increase or decrease

[3]The Omnibus Budget Reconciliation Act of 1993 acknowledges the importance of the private radio industry and requires the Chairman of the Commission to meet with the Commerce Department yearly to provide Commerce with information about private radio needs. PCIA understands from Commission personnel that the Commission and the Commerce Department have not as yet held the required meetings and encourages them to do so as soon as possible.

their area of coverage, may cut rates or raise rates. Regardless of the direction public systems may take, the ability to build and operate a private radio system must be preserved. The well-engineered private network has, and will continue to have, certain attributes that are not just desirable, but essential, including:

(1) The private network can be customized, upgraded, and realigned as necessary to yield high performance at a reasonable infrastructure cost.

(2) The single user/operator can accommodate increased or seasonally erratic data traffic within his existing system, adding capacity in a step function, without incurring additional subscriber costs.

(3) Control of the network is in the hands of the system's owner/operator, enabling swift reaction to coverage and capacity challenges, and special traffic requirements.

Members of PCIA's Private Systems Users Alliance has determined that certain types of users have such specialized requirements that it is unlikely that a carrier system could ever serve their needs, regardless of the drop in price of technology. A discussion of such needs and the difficulties involved in obtaining service from commercial carriers are detailed in NABER's Comments in response to the NOI. PCIA/NABER requests that the Commission again review that document. Set forth below are additional examples from PCIA members representing large users in various industries demonstrating the need for dedicated private system spectrum.

1. Specialized Needs Of The Railroad Industry

It is extremely difficult for the railroad industry to obtain service from carrier systems. Railroad operations are so wide in

area that they require nationwide coverage. System coverage is not only necessary in major metropolitan areas, but also in desolate prairies and remote mountain areas. No one single supplier has the capability of providing economical services in all areas of railroad operation. Even satellite systems have problems communicating in the deep cuts of mountain passes as well as in tunnels.

The core business of railroading involves the coordinated movement of freight across the nation. This requires that all railroads must be capable of interoperating via radio communications as a train travels on various railroad properties. Interoperation inherently requires commercial providers to operate on a common platform or with a standardized set of specifications. Commercial providers typically do not utilize a common platform in an effort to capture a market share of communications. Therefore, it is unlikely that one interoperable radio will be capable of traveling from coast to coast without disruption of service.

Assuming that any commercial providers form an interoperable network, there are many major concerns with the operational quality and speed of repairs during an outage. First, typical commercial systems are designed for a peak loading which is substantially lower than the total number of possible users served. The effect is that during major disasters such as tornados, earthquakes and hurricanes, the systems become overloaded resulting in a total disruption of service. Second, time to repair may not meet the private system user's needs. In commercial applications, customers

can typically wait 4 to 12 hours for repairs to be completed. If an agreement is made for fast service, a premium is usually assessed thus raising the overall operations cost of the network.

Further, once a private user dissolves its radio system support staff and the related communications infrastructure, replacement of the staff and infrastructure is cost prohibitive. This places the private user in a noncompetitive position and at the pricing mercy of the commercial supplier.

The railroad industry needs additional spectrum for a number of technical and services advances. The following examples represent some of the uses for which the railroad industry needs new allocations of spectrum.

A. Video Transmission Applications

1. Remote observation by railroad and regulatory officials of a derailment site during restoration.

2. Remote observation by railroad and regulatory officials of Hazardous Material Clean Up.

3. Remote observation of terminal and yard operations by railroad managers to improve the efficiency of train makeup and yard operations.

4. Remote observation of major construction areas by railroad officials.

5. Provide one person train operations by allowing the engineer to manipulate the train movement remotely by means of radio control. The video portion is necessary so that the engineer can observe the area in front of and behind the train to ensure safety during moves.

B. Wide Band Wireless Data Transmission.

1. Provide high speed data transmission in track maintenance and construction areas.

(a) Maps for construction.

(b) Diagrams of equipment for repair purposes.

(c) Engineering curves/data information.

2. Communications with electronic messaging between employees.

3. Communications with electronic messaging on public systems such as Internet.

4. Remote data base access and manipulation for train operations.

5. Host computer communications for train operations.

The unavailability of spectrum for the railroad industry will have significant consequences. Having access to broad band spectrum will allow the railroad industry to become more efficient and customer responsive. Access to broad band spectrum will assist the railroad's never ending quest to provide safe operations for the public and employees.

2. The Overnight Package Delivery Services Also Have Specialized Spectrum Needs

The experiences of Federal Express Corporation ("FedEx"), domestically and internationally, with both private and commercial service providers illustrate private industry's spectrum concerns. Upon implementation of its domestic private network in 1980, there was no public service that even came close to fulfilling FedEx's need for mobile voice and data. Significantly, 14 years later, there is still no such commercial offering in this country.

FedEx's engineering staff has met repeatedly with providers and manufacturers and has examined cellular, RAM, Ardis, CoveragePlus and many other offerings, and taken a serious look at the MIRS technology developed by Motorola. To date, none of the

commercial equipment offered by the manufacturers or the services provided by the commercial communication organizations have been able to satisfy the intensive, complex communications needs of FedEx.

In short, FedEx has examined everything available from carriers and has found them all wanting. Settling for any of these offerings would degrade FedEx's service and FedEx itself would suffer.

Commercial service providers have noticed FedEx's pioneering efforts wherein to develop specialized equipment and protocols. These developments are not just desirable, but necessary to FedEx's extensive and cost effective private domestic network. Some of these innovations have been incorporated, to some extent, into commercial service offerings. In general, however, the equipment and service offered to commercial subscribers is more generic than those utilized by FedEx and is wholly inadequate for FedEx's needs. It is equally inadequate for a police department, a power company, an airline, or many other large organizations with specialized communication needs.

For these large and specialized users, being dependent on a public service provider is unacceptable and could spell disaster. Consider, for example, the ramifications of trying to make a time-critical cellular phone call and finding "all circuits are busy."

Public providers design their service based on a "typical" business from the general population, not on the unique requirements of specific users. Private networks, like that of

FedEx, are tailored for known coverage and capacity needs. An example of this is the relatively remote geography of the Mayo Clinic, which requires the services of FedEx on a daily basis. The rural nature of Mayo's location might cause a commercial network to decide against providing coverage there. A "business decision" relating to this type issue may work for the commercial provider, but it would seriously disadvantage the Clinic and FedEx. In fact, it would be unacceptable.

Additionally, the degree of security required by the large user is rarely available on a commercial service. Because FedEx has control of its system, FedEx builds in the necessary security processes, the safe-guards to maintain optimal response time and provides coverage where coverage is needed.

In comparison with commercial providers, FedEx has accomplished its communication goals using a minimum number of frequencies, even in the largest urban areas.

Internationally, depending on the country, FedEx has built private systems when it could, and when that option was unavailable, subscribed to commercial services. In many countries, there is no private spectrum. In such nations, all radio users, including FedEx, are obliged to accept the level of commercial service offered. The "other" choice is no radio system at all.

In one country without private spectrum, the commercial service provides data, but no voice service. To FedEx this is a serious compromise. However, in 1994 the commercial provider decided to "upgrade" their data network to attract a greater

variety and number of customers. This "upgrade" resulted in the sudden discontinuation of service to FedEx's essential handheld data devices. FedEx must now invest $500,000 to change out FedEx equipment in order to maintain compatibility with the "upgraded" commercial network with no benefit to FedEx or its customers whatsoever. This raises costs for FedEx and its customers alike.

In another country, FedEx's two-year development effort crashed when the public network announced that their market projections had proved incorrect and service was to be discontinued. It may be two to three years before FedEx is able to find even a partial solution to its communication needs there.

Though these examples occurred in other countries, they provide an object lesson for the U.S. Should private spectrum be eliminated or scaled down in favor of commercial communications providers, the problems FedEx has encountered in other countries would be duplicated here.

For example, the most attractive domestic nationwide voice and data offering FedEx has examined appeared, a few years ago, to have the potential to service its "over the road" trucks. Today this provider has discontinued its data layer in anticipation of upgrading to ESMR operation. Had FedEx elected to use this provider, FedEx would now be required to relocate its data needs to a satellite-based service (with its associated interface problems, as well as capacity, coverage and response-time issues) while still requiring the SMR for its voice needs. Without doubt, the cost of this degraded service would soar.

It is naive and overly simplistic for regulators to assume that the competition-based commercial services will rise to the demands of the marketplace. In FedEx's experience, it is the users who are obliged to downsize their expectations, to fit the "lowest common denominator" approach of the public provider.

3. Specialized Needs Of The Airline Industry

Airlines require 100% radio coverage in a small, defined area such as airports. Coverage is needed indoors as well as below ground level. Commercial providers are geared to provide wire-area coverage and typically fall short of the 100% area-of-operation coverage necessary at airports. Further, a commercial service provider will experience turnovers of their technical support team. This turnover directly effects the quality of service to the customer.

Airports are highly restrictive in regards to access. The radio coverage requirements would dictate the installation of equipment in areas where access is limited to airport employees and their vehicles, thus making the installation and servicing awkward and cumbersome to the provider. This hinders or sometimes prevents immediate service response in a timely manner.

Airlines have unique radio performance and hardware requirements which the commercial service provider typically does not "stock on the shelves". The provider would have to engineer or redesign for each application, thus extending the implementation date and charging high costs. Other requirements include mobile and portable radio performance in an airport environment where

unique high noise audio frequencies impedes the voice transmission and receive audio. In addition, the airline industry needs accessories that are modified for airline mechanics, ramp service and other specialized tasks. Further, dispatch radio/phone consoles are unique and modified for flight operations which includes aeronautical communications (requiring access to a completely different band of frequencies). Unique coverage areas also require redesign of the base equipment.

Airline operations require the support of numerous mobile personnel, vehicles and devices in the airport environment. Baggage vehicles must transfer luggage and cargo between aircraft and ground distribution points, often underground or deep within large buildings, as well as between other aircraft. Mechanics and other ground personnel servicing aircraft on the ramp often need to communicate with central control points concerning the particular flight-aircraft with which they are involved. Current and proposed future commercial carriers are not equipped to provide economical communications in the airport environment. Private radio spectrum is needed to accommodate these needs.

The airline industry needs additional spectrum for technical and service advances such as the following:

a. **Northwest Airlines**

Northwest Airlines ("Northwest") foresees a need for additional spectrum for Private Radio to accommodate an ever increasing need to collect and distribute data relating to the safe and economical operation and dispatch of aircraft. Because of the

special needs of airlines to communicate with diverse and numerous mobile entities within the airport environment during peak aircraft operating periods, commercial carriers are unable to provide reliable, economical service. Northwest has tried commercial carriers for voice operations in the past without success. Commercial carriers are geared to providing consumer needs that can tolerate significant delays; airline operations cannot withstand such delays.

Some of the special needs of airlines include:

1. DEICING

The FAA requires that data must be collected showing the amount and type of DEICING fluid used on an aircraft as well as the time of application. DEICING recently became an issue of heightened interest because of several airline accidents. Because weather conditions often dictate that an aircraft has just a few minutes from the time it was DEICED until it must takeoff, the accurate and efficient collection and distribution of DEICING data is critical to the safe departure of aircraft. The increase in voice communications during DEICING overloads existing voice channels because it occurs during adverse weather when communications needs in general increase. Future spectrum could provide the means to improve the efficiency of aircraft DEICING.

2. BAGGAGE HANDLING

The FAA requires positive bag-match for all international flights as an anti-terrorist measure; all bags located aboard international flights must match boarded passengers. Accurate

baggage and cargo data is also critical to the safe dispatch of flights due to aircraft weight and balance considerations and restrictions. Luggage and passengers are loaded simultaneously; RF data collection on the ramp at the aircraft bag loading point would improve this operation.

3. AIRCRAFT MAINTENANCE AND SERVICING

Diagnostic information can be downloaded from arriving aircraft and updated charts and flight releases could be uploaded to departing flights via RF data links. Aircraft servicing information such as meals and other passenger amenities could be transmitted via RF data links to improve efficiency.

4. CARGO HANDLING

RF data would be used to automate cargo handling and tracking information.

b. **America West Airlines**

America West Airlines, as a private user, needs to have its radio system perform the following activities which cannot be performed by a commercial carrier in an efficient, timely and effective manner for airlines which operate 24 hours a day, 7 days a week.

1. Immediate operational changes to user group requirements, e.g. regrouping of radios during inclement weather, environmental and operational requirements.

2. Immediate response to power failure or changes in operational policies.

3. Immediate reprogramming of radios during contingency planning and/or emergency planning requirement.

4. Actively control the operational status (enable/disable) of individual radios, thereby ensuring inventory integrity.

5. Perform constant user group software changes and configurations to enhance/improve operational efficiency with ability to satisfy user add/changes/moves.

c. **United Airlines**

United Airlines believes that there is a potential for promoting economic growth and competition and enhancing access to services when spectrum is used in the private sector. Some of the uses by United for the spectrum slated for reallocation are as follows:

1. Dedicated spectrum use in small, defined areas such as airports and surrounding support facilities;

2. Video imaging for aircraft maintenance, aircraft incidents and airport incidents;

3. Data for positive baggage check (bar code reading), Aircraft maintenance-electronic logbooks and decision processing/remote terminals;

4. Voice communications for Airport/Aircraft operations, telephone interconnect, Federally mandated safety and security programs, interoperability with public safety/service authorities, airlines needs for redundant systems and the ability to operate during natural disasters (i.e. earthquakes, tornadoes, etc.);

United Airlines supports the needs of the public safety community regarding spectrum allocations and interoperability. Airport/aircraft situations dictate interoperability not just between public safety organizations but to some extent, between airport public safety authorities and an airline carrier.

These and other special requirements for the airline industry further define its very special operational needs to promote and ensure safe and efficient airline operations.

4. Specialized Needs Of Other Large Users

Westinghouse Communication Services, Inc. utilizes spectrum in many unique ways, a partial list of which follows below. It is Westinghouse's belief that such uses cannot be cost effectively replaced by carrier services.

1. Nuclear Response Team: This team responds to nuclear problems nationwide. Private Radio itinerant frequencies are used by the team to coordinate activities;

2. Wireless inventory (barcode) systems within warehouses and storage facilities;

3. Bar-code tracking of hazardous waste containers within waste disposal facilities;

4. Driver monitoring of temperatures in long haul refrigerator trucks when the drivers are away from the vehicles;

5. Facility Security Systems, where security personal cannot afford to get a "busy signal" when human life may be endangered;

6. Remote control of unmanned vehicles used in monitoring operations and processes that are not "user friendly".

Westinghouse believes that new spectrum is needed for air to ground transmission of data and video. This spectrum would be used for highway traffic monitoring, power/pipe line surveillance.

Damage assessment during disasters. Law enforcement surveillance, etc.

C. Specific Allocation Request

PCIA requests that the Commission allocate the 2390-2400 MHz band exclusively for private system use. PCIA further requests that this spectrum be paired with 2300-2310 MHz (which is to be released later) in order to facilitate duplex communications without the transmit/receive spacing difficulties faced in the 220 MHz band.

The 2390-2400 MHz band is relatively lightly loaded. Such use by private systems can co-exist with amateur users, with amateur users continuing to operate on a shared basis. As the Commission is aware, spectrum was successfully shared between the private users and amateurs (on a secondary basis) in 450 MHz band when such spectrum was allocated for private use. In fact, private use in this band may actually enhance the ability of amateurs to use the band, as "off the shelf" private user transmitting equipment would become available at a reasonable price which could be used by amateurs.

PCIA believes that this spectrum, if assigned for private use only, will go a long way towards solving some of the near-term needs of the private user community. The Commission has recently made carrier spectrum available for narrowband PCS, broadband PCS and 220 MHz SMRs. Further, the Commission is poised to make available the 900 MHz SMR spectrum outside of the Top 50 DFAs and is revamping its 800 MHz SMR Rules to allow carriers in that band

to more effectively compete. Thus, there are carrier options available to serve users which can be accommodated on carrier systems. Moreover, future allocations may also provide carrier capacity as additional Federal Government spectrum is made available for non-government use.

III. CONCLUSION

The large private radio user - the Public Safety agencies, the utilities, airlines, petroleum companies, FedEx and other large organizations will always need, and use, spectrum for innovative, cost-effective private systems, each of which is designed to meet specific and varied communication needs. The reliability of a public system - its staying power, its ability to perform - will always be in serious question to the organizations who very existence depends upon radio communication. Private users have devoted considerable resource to being open minded in the realm of public service offerings. However, often there is no carrier organization that can guarantee large private users the service that private users already provides for themselves through the use of private spectrum and self-developed equipment.

WHEREFORE, the Personal Communications Industries Association respectfully requests that the Commission act in accordance with the views expressed herein.

Respectfully submitted,

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