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FILE

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

In the Matter of:	)	
	)	ET Docket No. 92-100
DIAL PAGE, INC.	)	RM-7977
MOBILE TELECOMMUNICATION TECHNOLOGIES CORPORATION	)	RM-7978
PACTEL PAGING	)	RM-7979
PACTEL PAGING	)	RM-7860
PAGEMART, INC.	)	RM-7980
	)	

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JUN 16 1992
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REPLY COMMENTS

MOBILE TELECOMMUNICATION
TECHNOLOGIES CORPORATION

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Dated: June 16, 1992

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SUMMARY

In its comments, Mtel proposed a basic public policy framework for evaluating the pending petitions for rulemaking. Three fundamental guidelines were suggested: (1) services authorized should incorporate next generation capabilities rather than replicating existing offerings; (2) competitive entry opportunities and spectrum efficiencies should be maximized by limiting authorizations to 50 kHz per licensee; and, (3) flexible service rules should be pursued consistent with interference and Table of Allocation considerations. In order to implement these principles, Mtel also submitted detailed proposed amendments to the Commission's rules.

After reviewing the record now before the Commission, Mtel believes that these proposed rules should be refined in several key respects. First, the vast majority of the AMS proposals contemplate either 25 kHz or 50 kHz assignments. Within these broad service categories, there are plans for national, regional or local systems offering different degrees of functionality and addressing different perceived consumer needs.

In order to maximize opportunities for emergence of new, market driven services, the Commission could readily accommodate these proposals through a simple channelization plan for 930-931 MHz:

- 250 kHz allocated for ten 25 kHz Advanced Messaging Services operating on a local, regional, or national basis.
- 150 kHz allocated for three 50 kHz Nationwide Wireless Network messaging services.
- 350 kHz allocated for seven 50 kHz Advanced Messaging Services operating on a local, regional, or national basis.

- 250 kHz initially held for future uses based upon marketplace experience.

This approach would immediately establish twenty new advanced messaging service providers while holding spectrum for future growth needs.

Mtel's previously submitted rule proposals that seem sufficiently flexible to provide a foundation for almost all of the pending petitions. Licensees would be free to self-define their services and deploy their own technological approaches consistent with interference and Table of Allocation limitations. In the rulemaking process, comments could be solicited to identify any problems associated with accommodating any specific system.

A key to creating these enormous opportunities for diverse new services is to impose some reasonable limits on the amount of spectrum assigned to any one licensee. In such respects, PageMart, Inc. ("PageMart"); Paging Network, Inc. ("PageNet"); Freeman Engineering Associates, Inc. ("Freeman") and NAC, Inc. ("NAC") depart from the narrowband nature of this proceeding to propose systems that require at least 250 kHz for each licensee. These proposals demand too much spectrum (ten times the amount assigned for traditional paging systems) and foreclose too many opportunities for others (a maximum of four competing systems instead of twenty or more).

PageMart and PageNet, recognizing the exclusionary effects of their large spectrum demands, oppose any other potential uses of 930-931 MHz and aggressively attack the merits of all other service proposals. As detailed below, their criticism of Mtel's NWN plans are particularly ill-founded and misguided. In fact, NWN represents an enormous, fully verified stride forward for American consumers in contrast to the undocumented, flawed and

inefficient service approaches advanced in their petitions. Accordingly, the Commission should promptly adopt a Notice of Proposed Rulemaking based upon Mtel's proposed rules.

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REPLY COMMENTS OF MOBILE TELECOMMUNICATION TECHNOLOGIES CORPORATION

Mobile Telecommunications Technology Corporation ("Mtel"), by its attorneys, herewith submits its reply comments in the above-captioned proceeding to establish advanced messaging services ("AMS") in the 930-931 MHz band. As the country's first provider of nationwide paging services, Mtel now seeks to pioneer the next generation of messaging services in its Nationwide Wireless Network ("NWN") service proposal. NWN would use a 50 kHz channel to introduce sophisticated messaging services on a nationwide basis at data rates 20 times faster than today's typical simulcast paging systems. This innovation portends great benefits for the American public.

Thirteen other proponents of new messaging services have joined Mtel in seeking prompt Commission approval for new uses of the 930-931 MHz band. While a portion of this 1 MHz should be reserved for three competing NWN systems (150 kHz), this still would leave a large amount of spectrum (850 kHz) available for other narrowband data and messaging services. In fact, with careful planning, any meritorious proposals could be

accommodated within this band under broad, flexible rules allowing for innovation and market driven services.

As detailed below, Mtel has previously proposed and further refined herein a regulatory framework to maximize opportunities for a wide variety of different and competing services. A simple channel plan based upon 25 kHz and 50 kHz license assignments will permit at least twenty new messaging service providers. With these modest limitations on the amount of spectrum awarded to any given service provider, the American public can receive a wealth of choices and options in a robustly competitive marketplace.

I. THE COMMISSION HAS RECEIVED A WIDE VARIETY OF PROPOSALS FOR NEW ADVANCED MESSAGING SERVICES

The Commission has received a wide variety of proposals for new advanced messaging services. Fourteen different companies have submitted plans for expanding consumer choices and capabilities through technological improvements in conventional paging or new, next generation messaging services. They seek to address a wide range of needs for mobile consumers. As summarized below, they include Mtel's proposal for three 50 kHz NWN assignments; other proposals for 50 kHz advanced messaging services; proposals for 25 kHz advanced messaging services; and, large spectrum requests for services requring 250 kHz or more.

A. Mtel's Nationwide Wireless Network Service

On November 21, 1991, Mtel requested that the Commission allocate three 50 kHz channels in the 930-931 MHz for a new innovative Nationwide Wireless Network ("NWN").[1] Mtel's *NWN Petition* proposed use of sophisticated and innovative modulation techniques and an innovative Advanced Dynamic Frequency Management ("ADFM") scheme to provide highly efficient two-way messaging capabilities for laptop, palmtop, and other portable computing devices. At the same time, Mtel filed a request for a pioneer's preference to recognize the innovations that Mtel developed to implement this ground breaking new service.[2]

Mtel's proposed Nationwide Wireless Network ("NWN") service transcends existing technological limitations to introduce the next generation of advanced messaging services. Today's paging services are strictly one-way and typically limited to 1,200 bps. Tomorrow's NWN service would shatter these constraints:

- ***Speed.*** NWN will support extensive high speed messaging at up to 24,000 bps to facilitate a high capacity nationwide service.

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[1] *Mobile Telecommunication Technologies Corporation Request for a Pioneer's Preference Regarding its Petition for Rulemaking to Allocate 150 kHz in the 930-931 MHz Band and to Establish Rules and Policies for a New Nationwide Wireless Network (NWN) Service*, ET Docket No. 92-100, PP-37 (filed November 21, 1991) ["*NWN Preference Request*"].

[2] *See also Mobile Telecommunication Technologies Corporation Petition for Rulemaking to Allocate 150 kHz in the 930-931 MHz Band and to Establish Rules and Policies for a New Nationwide Wireless Network (NWN) Service*, ET Docket No. 92-100, RM-7978 (filed November 21, 1991) (proposing to allocate three 50 kHz channels for competitive NWN carriers) ["*NWN Petition*"]; *See also Mobile Telecommunication Technologies Corporation Technical Feasibility Demonstration on its Request for a Pioneer's Preference Regarding its Petition for Rulemaking to Allocate 150 kHz in the 930-931 MHz Band and to Establish Rules and Policies for a New Nationwide Wireless Network (NWN) Service*, ET Docket No. 92-100, PP-37 (filed June 1, 1992) ["*NWN Technical Feasibility Demonstration*"]. Mtel also submitted an experimental license application on November 21, 1991, which was granted on April 6, 1992.

- ***Capacity.*** NWN will initially support 600,000 to 800,000 subscribers with the ability to increase capacity if needed.

- ***Two-Way Functionality.*** NWN will support multiple levels of reverse channel service depending upon the specific requirements of the end user -- automatic acknowledgement from portables that a message has been received to support "return receipt requested" applications; user-interactive simple preformatted acknowledgements to confirm messages have been received by the end user; and, full two-way transfer capability for short and extended length digital data.

- ***Nationwide Coverage.*** NWN offers transparent nationwide coverage familiar to today's users of wide area and nationwide paging systems. NWN will also support seamless interconnection with AMSC's mobile data services to provide coverage even in the most remote areas.

- ***Application Independence.*** NWN offers an application independent digital data transmission service that can be customized for each user's requirements.

- ***Adaptable Functionality.*** NWN supports variable levels of error detection and correction capability, as well as encryption, prioritization, and many billing options depending upon each end user's requirements.

- ***Support for Industry Standards and Customized Needs.*** Interfaces supporting numerous industry standards are planned to allow the broadest compatibility between NWN and wireline messaging systems. Specialized arrangements will also be available to support specific needs for customers.

Thus, NWN offers an unprecedented leap forward in messaging capabilities coupled with national two-way functionality.

Mtel, in its companion reply comments to its pioneer's preference request, has demonstrated that there will be substantial demand for NWN's nationwide enhanced messaging capabilities.[3] Mtel's initial market demand studies, tentatively confirmed by A.D. Little, indicate that there will an addressable market of 2.73 million users in 1995.[4] This market includes only those professionals with mobile communications needs who also

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[3] *See Mtel Reply Comments*, ET Docket 92-100, PP-37 (filed June 16, 1992).

[4] *Id.*, Exhibit A at 2-3.

have intensive intercity travel requirements. ADL also indicates that NWN has the potential to "garner a significant share" of this addressable market.[5]

B. Other 50 kHz Advanced Messaging Proposals

Aside from Mtel's NWN proposal, the Commission has received four other proposals for 50 kHz services. Echo Group, L.P.("Echo"); Metriplex, Inc. ("Metriplex"); Mobile Communications Company of America ("MCCA"); and PacTel Paging, Inc. ("PacTel") have also advanced proposals for the following systems:

- ***Hybrid Data Network with Acknowledgement Paging.*** Metriplex proposes a national system combining the features of a high-speed, one-way data and paging service with the functions of an acknowledgement paging system. Metriplex has requested two 25 kHz channels per provider be allocated for its service.[6]

- ***Mobile Data Radio Service.*** Echo would allow the two-way exchange of digital data among laptops, notebook computers, and fixed computers. Echo has requested allocation of 300 kHz for 6 nationwide MDRS providers.[7]

- ***Advanced Architecture Paging.*** PacTel has petitioned the Commission to allocate all 930-931 MHz spectrum unused by AMS for regional Advanced Architecture Paging ("AAP") services. AAP offers an unformatted digital data stream on either 25 or 50 kHz channels suitable for a number of applications.[8]

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[5] *Id.*

[6] *See* Pioneer's Preference Requests Accepted in ET Docket No. 92-100, *Public Notice*, Rpt. No. DA 92-712 (rel. June 4, 1992); *Metriplex, Inc. Request for Award of a Pioneer's Preference for Hybrid Data Network With Acknowledgement Paging in the 930-931 MHz Band*, ET Docket No. 92-100, PP-81 (filed June 1, 1992).

[7] *See* Petitions for Rulemaking Filed, *Public Notice*, Rpt No. 1858 (August 26, 1991); *Echo Group, L.P. Petition for Rulemaking to Amend Section 2.106 of the Commission's Rules to Create a New Mobile Data Radio Service ("MRDS") in the 930-931 MHz Band*, RM-7782 (filed July 30, 1991).

[8] *See* Petitions for Rule Making Filed, *Public Notice*, Mimeo No. 22912 (April 30, 1992); *PacTel Paging Petition for Rulemaking for Amendment of the Table of Frequency Allocations and Part 22 of the Rules Relative to the Allocation of Reserve Spectrum for a Common Carrier Advanced Architecture Paging Service*, RM-7979 (filed August 2, 1991).

- ***Verified Information Paging Service.*** MCCA has proposed a high speed simulcast wireless transmission network to provide faster data rates and longer messages than traditional paging services. MCCA has requested 50 kHz per VIP provider.[9]

C. 25 kHz Advanced Messaging Proposals

The Commission has received five proposals contemplating 25 kHz advanced messaging services. Dial Page, Inc. ("Dial Page"); Skycell Corporation ("Skycell"); Edwards/Montauk Telecommunications Company ("Montank"); Global Enhanced Messaging Venture ("GEM"); and PacTel Paging ("PacTel") all seek spectrum for new offerings. Briefly, they may be characterized as follows:

- ***Acknowledgement Paging Service.*** Dial Page has requested allocation of 75 kHz to permit three operators to provide regional Acknowledgement Paging Service ("APS"). APS will allow a pager user to immediately acknowledge receipt of a page.[10]

- ***Enhanced Narrowband Data and Paging Service.*** GEM proposes an allocation of three 25 kHz channels for a nationwide paging service and three 25 kHz channels for a regional paging service combining a data transmission speed in excess of 6,000 bps with new techniques to increase efficiency of delivering alphanumeric data.[11]

- ***Ground-to-Air Paging.*** PacTel also has requested the Commission to allocate three 25 kHz channels for regional Ground-to-Air Paging ("GAP") services. GAP is

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[9] *See* Pioneer's Preference Requests Accepted in ET Docket No. 92-100, *Public Notice*, Rpt. No. DA 92-712 (rel. June 4, 1992); *Request by Mobile Communications Corporation of America for a Pioneer's Preference for Verified Information Paging Service*, ET Docket No. 92-100, PP-82 (filed June 1, 1992).

[10] *See* Petitions for Rule Making Filed, *Public Notice*, Mimeo No. 22912 (April 30, 1992); *Dial Page, Inc. Petition for Rulemaking for Amendment of the Table of Frequency Allocations and Part 22 of the Rules Relative to the Allocation of Reserve Spectrum for a Common Carrier Acknowledgement Paging Service*, RM-7977 (filed October 11, 1991).

[11] *See* Pioneer's Preference Requests Accepted in ET Docket No. 92-100, *Public Notice*, Rpt. No. DA 92-712 (rel. June 4, 1992); *Global Enhanced Messaging Venture Demonstration of Technical Feasibility and Request for Pioneer's Preference Regarding Amendment of Parts 2 and 22 of the Commission's Rules to Establish an Enhanced Narrowband Data and Paging Service in the 930-931 MHz Range*, ET Docket No. 92-100, PP-80 (filed June 1, 1992).

intended to extend the benefits of conventional paging to subscribers in transit on airplanes.[12]

- ***Public Facsimile Service.*** Montauk proposes that several 25 kHz channels be reserved "for an advertiser-supported service which would deliver, via radio, newspaper-like publication to FAX machines equipped with special receivers."[13]

- ***Telepoint Management Radio.*** Skycell proposes allocation of a 25 kHz channel to synchronize the transmissions of CT-2 base stations and handsets in a given area.[14]

D. 250 kHz Advanced Messaging Services

In contrast to the narrowband approach of all other system proponents, four companies seek large blocks of spectrum for their exclusive use. PageMart, PageNet, NAC, and Freeman Engineering Associates ("Freeman") propose services requiring 250 kHz or more of spectrum. They include the following:

- ***Enhanced Paging Service.*** Freeman proposes a new wide band paging service which allows the integration of multiple modes of operation on a single paging channel to provide tone plus voice, tone only, digital readout, alpha-numeric and electronic mail services. Freeman has requested a total of 262 kHz for a single EPS provider.[15]

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[12] *See* Petitions for Rule Making Filed, *Public Notice*, Mimeo No. 22912 (April 30, 1992); ***PacTel Paging Petition for Rulemaking for Amendment of Parts 2 and 22 of the Commission's Rules to Provide for a Land-Based Common Carrier Ground-to-Air Paging Service in the 930 to 931 MHz Band***, RM-7860 (filed October 15, 1991).

[13] *See* Petitions for Rulemaking Filed, *Public Notice*, Rpt. No. 1853 (July 19, 1991); ***FAX-MAX Services Co. Petition for Rulemaking for Creation of a New Radio Service "Public Facsimile Broadcast Service" and Allocation of Spectrum Therefor***, RM-7760 (filed May 22, 1991) [***"Montauk PFBS Petition"***]. Edwards/Montauk Telecommunications, Inc. was previously known as "FAX-MAX Services Co.").

[14] *See* Pioneer's Preference Requests Accepted in ET Docket No. 92-100, ***Public Notice***, Rpt. No. DA 92-712 (rel. June 4, 1992); *Skycell Corporation Request for a Pioneer Preference Determination Regarding Creation of a New Service: Telepoint Management Radio and Allocation of Spectrum Therefor*, ET Docket No. 92-100, PP-85 (filed June 1, 1992).

[15] *See* Pioneer's Preference Requests Accepted in ET Docket No. 92-100, ***Public Notice***, Rpt. No. DA 92-712 (rel. June 4, 1992); *Freeman Engineering Associates Request for Award of a Pioneer's Preference*, ET Docket No. 92-100, PP-79 (filed June 1, 1992).

- ***Personal Information Messaging Service.*** PageMart has requested an allocation of 800 kHz to allow two nationwide (250 kHz each) and two local providers (150 kHz each) to offer Personal Information Messaging Services ("PIMS"). PIMS would allow real-time two-way communications between mobiles and the landline network.[16]

- ***Personal Network Access Communications.*** NAC has proposed to use 250 kHz in the 901-902, 930-931, or 940-941 MHz bands to provide a Personal Network Access Communications Service ("P*NAC"). P*NAC will provide person-to-person signaling while using the existing telecommunications networks for voice communication.[17]

- ***VoiceNow.*** PageNet proposes a service which alerts subscribers that a voice message has been received and stores the message in the pager to provide subscribers the ability to listen to their voice pages when they want. PageNet requests a total of 250 kHz per VoiceNow provider.[18]

E. Basic Issues Raised by the Proposals

The numerous proposals discussed above are summarized in the chart attached as Exhibit A hereto. A review of these fourteen proposals raises several basic questions. What general limitations should be placed on the amount of spectrum assigned for a given service? How can 25 kHz and 50 kHz uses of the band be best accommodated? How many national, local or regional systems should be established? Are any of these services better suited for

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[16] *See* Petitions for Rule Making Filed, *Public Notice*, Mimeo No. 22914 (rel. April 30, 1992); *PageMart, Inc. Petition for Rulemaking to Allocate 800 kHz in the 930-931 Mhz Band and to Establish Rules and Policies for a New Nationwide and Local Personal Information Messaging Service*, ET Docket No. 92-100, RM-7980 (filed February 28, 1992).

[17] *See* Pioneer's Preference Requests Accepted in GEN Docket 90-314 (November 27, 1991); *Request by NAC, Inc. For Grant of a Pioneer's Preference for its Personal Communications Service*, PP-14 (filed July 30, 1991).

[18] *See* Pioneer's Preference Requests Accepted in ET Docket No. 92-100, *Public Notice*, Rpt. No. DA 92-712 (rel. June 4, 1992); *Paging Network, Inc. Request for a Pioneer's Preference For Pioneering the Ability for Spectrally Efficient, Cost Effective One-Way Mobile Voice Communications in the 930-931 MHz Band*, ET Docket No. 92-100, PP-84 (filed June 1, 1992).

licensing in spectrum other than the narrowband 930-931 MHz frequencies? Should any of the proposals be eliminated for technical, legal or sound allocation reasons? Each of these important issues is addressed below.

II. A SIMPLE CHANNEL PLAN WITH REASONABLE LIMITATIONS ON SPECTRUM FOR EACH SERVICE CAN ACCOMMODATE NWN AND A WEALTH OF OTHER NEW MESSAGING SERVICES

A. Mtel's Proposed Plan for NWN and Advanced Messaging Services

A review of the pending proposals suggests a simple and logical approach to establishing service categories and spectrum assignments. First, there is a natural grouping of services based upon narrowband 25 kHz and 50 kHz channel needs. The 25 kHz proposals generally build upon existing one-way paging capabilities to add acknowledgement features, improve data rates, expand alphanumeric capabilities or extend coverage. The 50 kHz proposals, like NWN, would take the state-of-the-art one step further to introduce sophisticated high speed messaging services. Collectively, the 25 kHz and 50 kHz proposals represent a continuum of services affording the consumer with important new options and alternatives.

Second, the flexible rules proposed by Mtel for NWN could be readily adapted to provide a general framework for deploying all of these services. While three specific NWN assignments are warranted, all of the proposed services could be introduced under Mtel's proposed generic rules with some adaptation of the emissions mask provisions. This would permit each company to pursue its own service goals on a marketplace driven basis.

Third, the proposed rules should accommodate both one-way and two-way services. There is no need to artificially constrain advanced messaging services from expanded one-way offerings or next generation two-way features. Indeed, a review of the proposals suggests that any potential boundary line between one-way and two-way services is already blurred and would be increasingly ephemeral.

Fourth, despite suggestions to the contrary, there is no technical obstacle to a channelization plan that includes one-way and two-way services using 25 kHz and 50 kHz channels.[19] While noise from adjacent channel base station transmitters can desensitize a fixed receiver, this problem has not prevented the use of simplex systems in other services and the use of in-band link receivers to feed paging transmitters.[20] Careful system engineering and the development of a reasonable channelization plan will minimize such effects. In short, just because messaging has in the past been constrained to be solely a one-way service is no reason to shackle the Advanced Messaging Service.

In view of the foregoing, Mtel proposes that the Commission adopt the following channelization plan for 930-931 MHz narrowband data and messaging services:

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[19] *See, e.g., Comments of Arch Communications* at 6, ET Docket No. 92-100 (filed June 1, 1992).

[20] NWN has the advantage of being able to employ several techniques to overcome such problems. First, the return signal will use a relatively narrowband (25 kHz) channel operating at 9.6 kbps that is embedded within the 50 kHz channel. The built-in guardband affords at least 20 dB of additional protection. Second, Mtel will employ careful site selection and avoid traditional land mobile transmitter sites for its remote receivers. Most receivers will be atop buildings in order to avoid noisy locations and to place the receivers closer to the portable users. Third, there will be a multiplicity of receivers. This will increase the likelihood that reception from portables will benefit from "near-far" effects with respect to adjacent channel interferers. As detailed in the *Technical Feasibility Demonstration*, Mtel will also be able to determine whether a given receiver has been corrupted over time by unanticipated noise and then take corrective action. *Mtel Technical Feasibility Demonstration* Exhibit E at 39. Fourth, there are other techniques that can be employed in the more extreme cases including directional receive antennas to null out an interferer, polarization diversity reception, and even interference cancellation methods. Moreover, within the band, careful adherence to the emissions mask will help to reduce the adjacent channel noise. *See Id.*, Exhibit A at II-9.

- 250 kHz assigned for ten advanced messaging service providers operating with 25 kHz channels.
- 150 kHz assigned for three nationwide NWN systems operating with 50 kHz channels.
- 350 kHz assigned for seven other messaging systems operating with 50 kHz channels.
- 250 kHz held for future growth and expansion.

As detailed in these comments, this plan would promote opportunities for robust competition and industry innovation.

B. Proposals Requiring Excessive Amounts of Spectrum Should Not Be Included Within the Narrowband 930-931 Assignments

Mtel's proposed channel plan could accommodate ten of the fourteen pending proposals. The four that could not be included all involve requests for 250 kHz or more of spectrum for each service provider. Placed in context, these requests would utilize at least ten traditional paging channels for one-way or two-way messaging service. Yet, none of these system proponents explain why such excessive and inefficient spectrum requests are warranted.

Two of the proposals seeking 250 kHz or more per licensee involve one-way services. PageNet would use 250 kHz for a voice paging service. This is an extraordinarily inefficient use of spectrum for a service which has failed to prosper in the past. NAC on the other hand, would deploy a personal signaling system in its 250 kHz. NAC has acknowledged that its interest could be accommodated in other spectrum where broader band operations might

be considered. Moreover, its continued interest in the 930-931 MHz band appears uncertain.[21]

With respect to the two-way service proposals, Freeman wants 262 kHz of spectrum for a combined tone, tone/voice and alphanumeric paging service with acknowledgement capabilities. No where does Freeman explain how use of more than ten traditional paging channels is an efficient use of spectrum given the fact that its four capabilities individually can be offered today through four 25 kHz channels. Similarly, PageMart's proposed Personal Information Messaging Service is simply a spectrally inefficient approach to accomplishing what Mtel and others can perform in just 50 kHz of spectrum.

In sum, the four proposals for systems requiring 250 kHz or more of spectrum are not appropriate for assignments in the narrowband 930-931 MHz allocation. They are too excessive in their spectrum needs and pose too great a barrier to opportunities for more efficient service proposals. For example, Mtel's plan would allow at least twenty new service providers and afford spectrum for five to ten additional future systems. In contrast, the PageMart, PageNet, Freeman and NAC proposals would limit use of the entire band to just four service providers. Accordingly, these services should not be pursued at this time and in this band.

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[21] It appears from the record, and the lack of filings in this docket, that NAC no longer is interested in pursuing a request for 930-931 MHz spectrum.

III. IN APPARENT RECOGNITION OF THEIR PRECLUSIONARY EFFECTS UPON ANY OTHER USES OF 930-931 MHz, PAGEMART AND PAGENET OPPOSE ALL OTHER ADVANCED MESSAGING SERVICE PROPOSALS

PageMart and PageNet have each sought nearly exclusive use of the entire 930-931 MHz band for their service proposals. Their ensuing attacks on all other AMS proposals can only be viewed as a necessary consequence of the preclusionary effect of their respective requests for spectrum. As discussed below, at least with respect to NWN, these criticisms are wholly unfounded. Furthermore, as evidenced by the serious technical problems inherent in their own proposed services,[22] neither PageMart nor PageNet have subjected themselves to nearly the same scrutiny they have applied to other proposals. Both of these proposals have severe and fatal technical defects.

A. PageMart and PageNet's Criticisms of NWN Are Ill-Founded

In response to Mtel's submissions, the Commission has received opposing comments from just two companies -- PageMart and PageNet.[23] PageMart and PageNet collectively cite four purported deficiencies: (1) the proposal is not innovative because high speed data transmission capabilities already exist; (2) NWN is spectrum inefficient and will face serious capacity limitations in comparison with local paging or messaging services; (3) NWN

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[22] PageMart has proposed a Personal Information Messaging Service ("PIMS"). Mtel is filing today a companion formal opposition against PageMart's pioneer preference request. *See Mtel Formal Opposition and Reply Comments*, ET Docket No. 92-100, PP-40 (filed June 16, 1992). PageNet, for its part, has requested a pioneer's preference for a VoiceNow service. Comments on PageNet's proposal will be due on June 16, 1992.

[23] *Comments of PageMart, Inc.*, ET Docket No. 92-100, RM-7679 *et al.* (filed June 1, 1992) ["*PageMart Comments*"]; *Comments of Paging Network, Inc.*, ET Docket No. 92-100, RM-7976 *et al.* (filed June 1, 1992) ["*PageNet Comments*"].

mobiles will be large and expensive with extremely short battery life; and, (4) NWN could be deployed in other spectrum or through other services more effectively. These alleged defects have been extensively discussed in Mtel's companion reply to comments on its pioneer preference request, and summarized below.

Innovation. PageMart insists that NWN's 3,000 baud and 24,000 bps data rates are not innovative because higher baud and bit rates are theoretically possible. This simplistic and misleading assertion ignores several salient facts:

- The 24,000 bps data rate is twenty times the speed of conventional paging systems in operation today and ten times the world's fastest existing simulcast system pioneered by Mtel.[24]

- The 3000 baud rate is significantly higher than the fastest commercially available simulcast system pioneered by Mtel in its 2400 baud Skytel operations.

- This mix of high speed messaging advances would provide subscriber capabilities not enjoyed any where in the world today through national simulcasting systems.

The goal of NWN is not simply to reach the theoretical outer limits of baud and bit speeds, but rather to implement high speed messaging capabilities in a technically feasible and commercially viable system.

Capacity and Spectrum Efficiency. PageMart and PageNet expend considerable energies purportedly demonstrating the "limited" capacity of NWN to meet subscriber needs. However, these alleged "constraints" simply reflect misstatements of the NWN system or inappropriate comparisons with capacities of dissimilar services:

- PageMart ignores the fact that NWN can support 600,000 to 800,000 subscribers initially and capacity can be increased if needed.

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[24] Mtel recently introduced 2400 bps capabilities in its SkyTel™ nationwide paging system.

- PageMart incorrectly assumes that NWN's initial 34 zones cannot or will not be increased to allow for additional spectrum reuse and system growth as needed.

- PageMart and PageNet incorrectly contend that NWN does not permit frequency re-use when the record clearly shows that Mtel will employ frequency re-use on both the forward and reverse channels.

- PageMart claims that interzone interference will limit the ability to zone for added capacity have been fully refuted by the *Mtel's Technical Feasibility Demonstration.*

- PageMart and PageNet attempt to engage in an "apples and oranges" comparison of NWN's nationwide simulcast system with local paging systems not designed for national, ubiquitous coverage.

The record demonstrates that NWN constitutes a landmark breakthrough which effectively integrates frequency re-use into a nationwide simulcast service.

PageMart and PageNet also insist that NWN constitutes an inefficient use of scarce spectrum when compared to their own respective PIMS and VoiceNow services. These claims hardly warrant serious response. A realistic comparison of NWN and PIMs shows that Mtel's proposed service is 2.7 times more spectrally efficient. Similarly, the VoiceNow service would consume the full 50 kHz of spectrum NWN requires in just handling signalling and control for its limited one-way voice paging system.

Mobile Size, Cost and Battery Life. Mtel will use mobiles operating at 2 watts or less in its NWN system. PageMart's claims that the NWN mobiles would be large and costly with short battery life are based upon the belief that Mtel would utilize mobiles operating at 7 watts. In such respects, PageMart misreads Mtel's proposed rules limiting power at 7 watts as its design specification. As documented in the *Mtel Technical Feasibility Demonstration*, this will permit small and low cost portables with long battery life.

Other Spectrum or Services. PageNet, for its part, asserts that Mtel could deploy NWN at 220 MHz, in its existing nationwide system or through cellular and SMR carriers. The channelization plans at 220 MHz (5 kHz) and 931 Mhz (25 kHz) quickly dispose of the alternative spectrum home claim. Furthermore, NWN will complement rather than compete with cellular and SMRs that focus on real-time voice communications instead of short data messaging.

B. In contrast, the PageMart and PageNet Proposals have Serious, Fatal Defects

PageMart and PageNet's proposed offerings, at their core, are relatively similar. Each proposes to utilize two 25 kHz channels for signaling and subscriber location, and an additional 8 data channels to deliver message data to subscribers using a four cell re-use scheme with channel borrowing. The utter lack of any indication whatsoever that this type of architecture is possible indicates, however, that neither PageMart nor PageNet has applied the same scrutiny to the technical foundation of their architecture as they have applied to other service proposals. In particular, neither discusses:

- ***Ability to Use a Four Cell Re-Use Plan.*** Both proposals simply postulate that a four cell re-use scheme is workable for messaging traffic without *any* discussion of the difficulties inherent in maintaining reliable communications with a carrier-to-interferer protection ratio of only 12.93 dB. In contrast, today's mobile communications services typically require a minimum co-channel protection ratio of 18 dB or higher.

- ***Cell Hand-Off.*** Neither PageMart nor PageNet have considered the possibility that cell hand-off may be required for their services, despite purporting to be able to handle significant message lengths at only 4800 bits/sec. Nor has either made any provision for signaling traffic required to support intercell hand-off.

- ***Capacity of Signaling Links.*** Neither PageMart nor PageNet have attempted to evaluate the capacity of the signaling links they utilize to control the remaining 8 data

channels. As discussed in Mtel's opposition to PageMart, its "polling channel" capacity appears to be limited to 12,000 subscribers per MSA, and the "return link" to even less. Nor has either party discussed the interference problems that will potentially occur in adjoining MSAs where the signaling links are simulcasting unsynchronized and dissimilar data.

- ***4800 Baud Simulcasting.*** Both PageMart and PageNet indicate that they will utilize 4,800 baud simulcast transmission for at least the "polling channel," completely dismissing, without any technical discussion, the extensive evidentiary record compiled in this proceeding that 3,000 baud is a practical limit on simulcast systems.

- ***Cell Channel Assignments.*** PageMart and PageNet each claim to be able to perform real time dynamic channel assignment without discussing the technical problems inherent in attempting to do so, and without recognizing that "channel borrowing" requires "borrowing" the cell from up to four adjacent cell groups to provide one additional channel for one cell (thus decreasing capacity).

- ***System Complexity Ramifications.*** Neither PageMart nor PageNet have effectively addressed the cost and complexity considerations for both base stations and portable units that are compatible with a cell-based architecture. Nor has either addressed the battery drain effects of requiring portables to continually monitor a "polling channel" and scan 8 other channels.

These problems are not simply engineering wrinkles to be ironed out in the system deployment phase. They are serious problems with the theoretical foundation of the PageMart and PageNet proposals.

IV. CONCLUSION

In view of the foregoing, the Commission should promptly adopt a Notice of Proposed Rulemaking to establish Mtel's innovative Nationwide Wireless Network service. In addition, through the simple channel plan and flexible rules suggested in these reply comments, a robustly competitive and market driven advanced messaging service industry

can rapidly emerge to meet consumer needs. This affords the Commission a unique opportunity to facilitate improved and expanded services to the American public.

Respectfully submitted,

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Dated: June 16, 1992

CERTIFICATE OF SERVICE

I, Kim Riddick, hereby affirm that on this 16th day of June, 1992, I have caused copies of the foregoing "Reply Comments" to be delivered, First Class Mail, postage pre-paid, to the following, except where service by hand is indicated:

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