

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

ORIGINAL
FILE

In the Matter of:

Amendment of the Commission's
Rules to Establish New Personal
Communications Services

)
) GEN Docket No. 90-314
) ET Docket No. 92-100
) RM-7980
) PP-40
)

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

PETITION FOR PARTIAL RECONSIDERATION

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TABLE OF CONTENTS

SUMMARY	i
INTRODUCTION	1
ARGUMENT	5
I. THE COMMISSION'S PIONEER'S PREFERENCE RULES PERMIT APPLICANTS TO DEMONSTRATE TECHNICAL FEASIBILITY BY SUBMITTING EITHER TEST RESULTS OR A WRITTEN SHOWING OF FEASIBILITY	5
II. THE RECORD IN THIS PROCEEDING DEMONSTRATES UNEQUIVOCALLY THAT PIMS FULLY MEETS THE COMMISSION'S PIONEER'S PREFERENCE STANDARD FOR "TECHNICAL FEASIBILITY"	12
A. PIMS is Technically (and Commercially) Feasible Today Using Currently Available, Off-the-Shelf Technology	12
B. PageMart's PIMS Proposal is Demonstrably Feasible on Each of the Technical Grounds Challenged in this Proceeding	16
C. Independent Authorities Confirm the Clear Technical Feasibility of PageMart's PIMS Proposal	16
III. UNDER THE CRITERIA APPLIED TO MTEL'S REQUEST FOR A PIONEER'S PREFERENCE, PAGEMART HAS CONCLUSIVELY DEMONSTRATED TECHNICAL FEASIBILITY AND ALL OTHER ELEMENTS OF A PIONEER'S PREFERENCE	18
CONCLUSION	21
Appendix A: PageMart Component Part List (Originally filed June 16, 1992)	
Appendix B: PageMart Response to MPR Teltech (Originally filed July 1, 1992)	
Appendix C: Motorola, Inc. Letter to Pagemart Regarding PIMS Technical Feasibility	
Appendix D: Report of SFA, Inc., on PIMS Feasibility	
Appendix E: American Cryptronics, Inc. Letter to PageMart Regarding Prototype of PCMCIA-Standard Receiver Card	

SUMMARY

PageMart's proposed Personal Information Messaging Service ("PIMS") represents a classic instance of entrepreneurial ingenuity which more than meets the Commission's standards for grant of a pioneer's preference. PIMS is a service which allows portable, wireless delivery of lengthy text, graphic and facsimile messages, on a nationwide basis, using device-independent subscriber transceivers. By combining existing communications technologies in an entirely new network design, centered on radiolocation and massive frequency re-use, PIMS offers major service advantages and substantial cost reductions with essentially "off-the-shelf" components: PIMS does not require the development of new high-speed coding or modulation schemes or the invention of new communications technologies.

The Commission's Notice accepted PIMS' innovativeness, but tentatively denied PageMart's request for a pioneer's preference, on the ground that PIMS is not "technically feasible," solely because PageMart has not yet submitted experimental test results. No party to this consolidated docket made any such argument. Indeed, the Commission's linkage of technical feasibility to experimental testing misconstrues the record and the relevant provisions of the Commission's Rules governing pioneer's preferences. Simply put, experimental test support is not required as a prerequisite of obtaining a preference. The Commission's tentative decision ignored or failed to consider the several substantive filings by PageMart which provide a detailed demonstration of both the technical and commercial feasibility of PIMS services.

Regardless of experimental test results, PageMart has fully met the requirements of the Rules by "submit[ing] a written showing that demonstrates the

technical feasibility of its proposal.” PageMart explained that it planned experimental testing merely to “confirm” and “refine” the specifications for commercial system-level implementation, not as the sole “demonstration” of technical feasibility of PIMS. Because PageMart’s proposal is based on an innovative application of technologies already proven in real-world environments, there is not and cannot be any legitimate question as to the technical feasibility of PIMS. Indeed, the feasibility showing made by PageMart exceeds that which the Commission found adequate in granting a pioneer’s preference to another party in this docket.

PageMart’s technical feasibility showing is also supported, in addition, by two highly relevant objective tests. First, Motorola, Inc., a principal manufacturer of network and subscriber paging equipment, has reviewed the PIMS proposal and has concluded that all of the network equipment and subscriber module functionalities for the service are available today or technically feasible. Second, SFA, Inc., a leading telecommunications engineering consultant, has examined the PIMS system specifications and has likewise concluded that each of the elements of PIMS is technically feasible.

Under the same criteria applied by the Commission in tentatively granting the competing preference application of Mobile Telecommunication Technology Corp., PageMart merits a pioneer’s preference for its PIMS innovation. On this record, the Commission must reconsider its tentative denial and either reverse the decision or explain how PageMart’s demonstrative technical submissions in some way fail to constitute a “written showing” of technical feasibility.

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PETITION FOR PARTIAL RECONSIDERATION

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

PageMart, Inc. ("PageMart"), by its attorneys and pursuant to Section 1.106 of the Commission's Rules, hereby petitions for reconsideration of that portion of the Notice of Proposed Rule Making and Tentative Decision ("Notice")¹ in this consolidated proceeding in which the Commission tentatively denied PageMart's request for a pioneer's preference for its proposed Personal Information Messaging Service ("PIMS").²

INTRODUCTION

PageMart's PIMS proposal represents a classic instance of entrepreneurial ingenuity which more than meets the Commission's standards for grant of a pioneer's preference. PIMS is a service which allows portable, wireless delivery of lengthy text, graphic and facsimile messages, on a nationwide basis, using device-

¹ FCC 92-333, released Aug. 14, 1992.

² The Commission's Office of Engineering and Technology ("OET") consolidated all 13 pioneer's preference requests involving Advanced Messaging Services ("AMS"), or narrowband PCS, into ET Docket No. 92-100, and solicited several rounds of public comment on these competing proposals in June 1992. No separate dockets have been established by the Commission for any of the individual AMS pioneer's preference requests, and the Commission's Notice expressly references "the pioneer's preference portion of both dockets." Notice ¶ 145 (emphasis supplied). As OET has confirmed to counsel for PageMart, because the Commission consolidated all the AMS pioneer's preference requests into a rulemaking docket, petitions for reconsideration are due no later than 30 days after publication of the Federal Register summary of the Notice (57 Fed. Reg. 40630 (Sept. 4, 1992)), or October 5, 1992. See Rule 1.4(b)(2).

independent subscriber transceivers. By combining existing communications technologies in an entirely new network design—centered on radiolocation and massive frequency re-use—PIMS offers major service advantages and substantial cost reductions with essentially “off-the-shelf” components. PIMS utilizes an adaptable, cell-based approach to system architecture to achieve up to a minimum of a 10-fold increase in subscriber throughput for advanced messaging without requiring the development of new high-speed coding or modulation schemes. Unlike the alternative proposals in ET Docket No. 92-100, therefore, PIMS achieves the central objectives of spectral efficiency, system capacity, message throughput, cost reduction and subscriber equipment portability in a manner that need not await the invention of new communications technologies.

In support of its PIMS proposal, PageMart submitted (1) a petition for rule-making³ and a request for pioneer’s preference,⁴ both accompanied by a detailed Technical Appendix describing the technical specifications of the proposed service, (2) comments and reply comments demonstrating PIMS’ comparative advantages to the proposed advanced messaging alternatives, accompanied by supplemental technical materials demonstrating the commercial availability of the network equipment to be used for PIMS,⁵ and (3) a reply to the “formal opposition” to PageMart’s proposal filed by Mobile Telecommunications Technologies Corp.

³ 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, RM-7980 (filed Feb. 28, 1992)(“Rulemaking Petition”).

⁴ Request for Pioneer’s Preference, PP-40 (filed March 19, 1992)(“Pioneer’s Preference Request”).

⁵ Comments of PageMart, Inc., ET Docket No. 92-100 (filed June 1, 1992)(“PageMart Comments”); Reply Comments of PageMart, Inc., ET Docket No. 92-100 (filed June 16, 1992)(“PageMart Reply Comments”).

("MTel"), accompanied by a technical response to MTel's assertion that PIMS is not technically feasible.⁶ The Notice recognizes the innovative nature of PIMS, because the Commission rejected a number of the other advanced messaging proposals (but not PIMS) on the express ground that they were not sufficiently new or innovative to justify award of a pioneer's preference.⁷

Nonetheless, the Commission's Notice concludes that PIMS is not technically feasible, solely because PageMart has not yet submitted experimental test results. Notice ¶ 153. No party to ET Docket No. 92-100 made any such argument. Indeed, the Commission's linkage of technical feasibility to experimental test results misconstrues the record in this proceeding and the relevant provisions of the Commission's Rules governing pioneer's preferences. Simply put, experimental test support is not required as a prerequisite of obtaining a preference. The Commission's tentative decision ignored or failed to consider the several substantive filings by PageMart which provide a detailed demonstration of both the technical and commercial feasibility of PIMS services.⁸ The record already contains more than sufficient information demonstrating the technical feasibility of PIMS.

PageMart's technical feasibility showing is also supported, in addition, by two highly relevant objective tests.⁹ First, Motorola, Inc., a principal manufacturer of

⁶ PageMart's Reply to Formal Opposition, ET Docket No. 92-100, PP-40 (filed July 1, 1992).

⁷ Notice ¶¶ 153 (PageNet), 154 (Freeman), 155 (Metriplex), 159 (PacTel Paging).

⁸ The abbreviated six-week period for Commission consideration of the record appears to have contributed to specific filings being overlooked or ignored. On July 1, 1992, PageMart moved to strike MTel's "formal opposition" and reply comments. PageMart's Motion to Strike Formal Opposition and Reply Comments, ET Docket No. 92-100, PP-40 (filed July 1, 1992). Neither in the Notice nor elsewhere has the Commission ruled on this motion.

⁹ See Section II(C) and Appendices C and D.

network and subscriber paging equipment, has reviewed the PIMS proposal and has concluded that all of the network equipment and subscriber module functionalities for the service are available today or technically feasible. Second, SFA, Inc., a leading telecommunications engineering consultant, has examined the PIMS system specifications and has likewise concluded that each of the elements of PIMS is technically feasible.

Regardless of experimental test results, PageMart has fully met the requirements of the Rules by “submit[ing] a written showing that demonstrates the technical feasibility of its proposal.”¹⁰ PageMart explained that it planned experimental testing merely to “confirm” and “refine” the specifications for commercial implementation of its system, not as the sole “demonstration” of technical feasibility of PIMS. Because PageMart’s proposal is based on an innovative application of technologies already proven in real-world environments, there is not and cannot be any legitimate question as to the technical feasibility of PIMS. On this record, the Commission is therefore required to reconsider its tentative denial and either reverse the decision or explain how PageMart’s demonstrative technical submissions in some way fail to constitute a “written showing” of technical feasibility.

Indeed, the feasibility showing made by PageMart exceeds that which the Commission found adequate to support tentative grant of a pioneer’s preference to MTel, the principal opponent of PageMart’s proposal. MTel claims it has invented modulation technology to simulcast at a rate of 24,000 bps in a 50 kHz channel, but

¹⁰ See Notice ¶ 147.

has offered in support only computer simulations projecting theoretically that such speeds might be achieved. Contrary to the Notice,¹¹ MTel has not demonstrated feasibility through “field trials” of an NWN system because no system capable of transmitting and receiving at a 24,000 bps data rate has been built or even modeled. Rather, MTel merely projects that supporting technologies for feasibly achieving its modulation scheme can be developed. Under the same liberal standard applied to MTel’s proposal, the Commission must also grant PageMart’s pioneer’s preference request, which relies on the existing, proven communications technologies of frequency reuse and radiolocation for throughput increases which exceed even those predicted by MTel.

ARGUMENT

I. THE COMMISSION’S PIONEER’S PREFERENCE RULES PERMIT APPLICANTS TO DEMONSTRATE TECHNICAL FEASIBILITY BY SUBMITTING EITHER TEST RESULTS OR A WRITTEN SHOWING OF FEASIBILITY

The Commission’s stated rationale for denying PageMart’s request for a pioneer’s preference, based on a single sentence isolated from PageMart’s preference request, is that PageMart “has not submitted even preliminary results of its [experimental] tests.”¹² This reasoning is inconsistent with the Commission’s Rules and incorrect as a matter of fact. Since the tentative preference decision is based on a misconception of the record and misapplies the relevant legal standard, it should be reconsidered.

¹¹ Notice ¶ 150.

¹² Notice ¶ 152.

The standards governing the Commission's consideration of pioneer's preferences are set forth in Sections 1.402, 1.403 and 5.207 of the Rules.¹³ Under these provisions, an applicant for a preference may demonstrate technical feasibility either through a written technical submission or having commenced an experiment.¹⁴ While the Commission has stated that the performance of an experiment will frequently be beneficial, experimental support is not "required as a prerequisite to obtaining a preference."¹⁵

The findings of an experiment will be a major component of the Commission's decision to grant a preference only if the applicant has relied upon an experiment rather than on a written technical submission.¹⁶ Indeed, in the Notice itself the Commission reiterated that its Rules require an applicant to submit either a technical feasibility showing or undertake an experiment:

a requester must have obtained an experimental license, commenced its experiment, and reported at least preliminary findings to the Commission that tend to confirm the technical feasibility of its proposal; or alternatively, a requester must have submitted a written showing that demonstrates the technical feasibility of its proposal. ¹⁷

It is thus beyond question that the pioneer's preference rules do not preclude applicants who hold experimental licenses from demonstrating technical feasibility by submitting a written showing with their applications.

¹³ 47 C.F.R. §§ 1.402, 1.403 and 5.207.

¹⁴ See Establishment of Procedures to Provide a Preference to Applicants Proposing an Allocation for New Services, 7 FCC Rcd. 1808, 1809 ¶ 11 (1992)("Preference Reconsideration Order").

¹⁵ Id. at ¶ 10.

¹⁶ Id. at ¶ 11.

¹⁷ Notice ¶ 147.

The detailed 28-page Technical Appendix annexed to PageMart's request for pioneer's preference—which addressed system architecture, re-use patterns, cell configurations, messaging sequences, polling channel and return link parameters, subscriber unit specifications, and system capacity estimates—satisfied the above requirements and more than adequately demonstrated the technical feasibility of PIMS. While PageMart also had been granted an experimental license, it chose to rely instead on its written technical submissions, stating plainly that it would conduct experiments “to confirm” the feasibility of specific system design parameters.¹⁸ As PageMart explained, the experiments are intended simply to “verify and refine key system elements and analyze areas of potential trade-offs.”¹⁹

The Commission's assertion that PageMart relied “only” on experimental results to support the technical feasibility of PIMS service (Notice ¶ 152) is just wrong. PageMart included its thorough Technical Appendix with the initial preference request precisely because it was relying on the Commission standard allowing technical feasibility to be “demonstrated” by a “written showing.” PageMart planned experimental tests for system-level implementation to “confirm” the commercial feasibility of its actual system design in urban RF applications. Accordingly, the Commission tentative decision to deny PageMart's request for a pioneer's preference is based on an incorrect premise. Since PageMart did not choose to rely on an experiment to “demonstrate” technical feasibility, but rather only to “refine” system design, “verify” service parameters and “confirm” commercial feasibility, the

¹⁸ Pioneer's Preference Request, at 13.

¹⁹ *Id.*

Commission's denial of PageMart's request on the ground that it has not yet submitted experimental test results is both plainly erroneous and procedurally unfair.²⁰

The Commission's Notice improperly takes a single sentence of PageMart's preference request entirely out of context, without any reference to the Technical Appendix or to the full briefing of technical feasibility issues in response to MTel's formal opposition. Even a cursory review of PageMart's application in its entirety, or any of PageMart's later submissions specifically addressing technical feasibility, shows that the Notice's conclusion that PageMart "relies only on its experimental results" (Notice ¶ 152) is simply incorrect. PageMart's substantive analysis of feasibility issues in Docket 92-100 repeatedly emphasized the "off-the-shelf" feasibility of the technology underlying PIMS service and never argued that experimental test results were its only basis for assessing technical feasibility. Yet contrary to all

²⁰ Testing was discussed in PageMart's petition for rulemaking in this same context:

PageMart received experimental authorization from the Commission in September 1991 for the development of cellular paging services. Using this experimental authorization, PageMart has continued to develop and refine the technological and engineering ingredients of Personal Information Messaging Service, including such advanced elements as two-way messaging capabilities, building and office-based cell configuration, and incorporation of RF transceivers in PCMCIA-like standard cards and AT-compatible computer boards. PageMart has worked closely with several equipment manufacturers, including Motorola, in its DBS-control paging systems and will continue to work with leading equipment manufacturers in the development of PIMS equipment prototypes.

Petition for Rulemaking, at 5; accord, Pioneer's Preference Request, at 3. With respect to feasibility, PageMart stated: "The foundation of PIMS is its innovative use of currently available and newly developed technologies in a unique mix to support substantial increases in both spectrum and cost efficiency." Petition for Rulemaking, at 8. This is just one example of how PageMart's repeated discussions of technical feasibility are flatly inconsistent with the misconception forming the basis of the Commission's preference decision.

notions of reasoned decision-making, the Notice neither references nor analyzes these substantive PageMart presentations on technical feasibility.

Indeed, despite strenuous objection by MTel to PageMart's proposal, not even MTel argued that PageMart's proposal should be rejected on the ground that experiments are necessary to demonstrate PIMS' technical feasibility. Since, as discussed below, the technical elements of PIMS service represent new applications of existing communications technologies, it is perfectly reasonable for PageMart to postpone experimental testing until the actual implementation phase of system development, where a variety of RF and related issues—as in every communications engineering application using wireless technologies—will need to be evaluated and resolved in the harsh, multipath environment of major urban areas.²¹ This testing will consist of setting up and operating a full working PIMS system, including all network components and non-miniaturized subscribed transceivers, and will be completed by year-end 1992.²² To say that such commercial system “refinement” requires testing or that feasibility will be “confirmed” by these sorts of tests, however, does not justify the Commission's apparent conclusion that technical feasibility can only be determined based on experimental results.

²¹ For instance, proposed PIMS technical specifications call for 100 mW subscriber transceivers, 10 mW “office cell” transmitters and 10W RF repeaters. Depending on the actual frequency allocated for PIMS and the deployment and power levels of RF systems in different real-world urban environments, however, these power specifications may prove to be more or less than optimal. Experimental testing is necessary precisely to “refine” and “verify” system parameters such as these.

²² Virtually the only piece of the PIMS system which has not yet been completely developed is the miniaturized, interchangeable PCMCIA-standard transceiver card. As PageMart has earlier emphasized, “PageMart's innovation is at the system conception and design level, while implementation utilizes existing technology in almost all facets of the design save for the PCMCIA card which is already in prototype.” Reply Comments, at 6. Prototypes of these transceiver cards have been developed by American Cryptronics, Inc. See Appendix E. Motorola agrees that “a ‘pager card’ can be developed to meet requirements with reasonable cost and size.” See Appendix C.

The Commission's stated rationale for rejecting PageMart's preference fails on another count. The precise status of an applicant's testing experimentation cannot be a determinative factor in light of the unpredictability of the timing of a Commission preference decision. The accelerated schedule for submission of comments and related materials in ET Docket No. 92-100,²³ as well as its unexpected inclusion in the broader PCS rulemaking and a Commission preference decision just six weeks after the close of the public comment period, all contrast sharply with earlier proceedings where the Commission deferred pioneer's preference decisions until well after release of an NPRM.²⁴ Thus, when PageMart in March 1992 stated in its preference request that it planned to file test results to "confirm" system design feasibility before the Commission's decision on its preference,²⁵ it fully expected to have sufficient time to conclude necessary product refinement and complete its work with equipment manufacturers prior to concluding its implementation testing program. Since the actual timing of a Commission preference decision is not in the control of the applicant, however, it is erroneous and fundamentally unfair to place decisional significance on the fact that experimental testing has not been concluded before the Commission's decision is announced, particularly when the applicant is not relying on tests to show technical feasibility.

²³ The Commission established a filing deadline for preference requests and two separate comment and reply comment cycles in short period between June 1 to June 29, 1992. See Public Notice, FCC 22922 (April 30, 1992); Public Notice, FCC 22914 (April 30, 1992); Public Notice, FCC 22915 (April 30, 1992); Public Notice, DA 92-712 (June 4, 1992)

²⁴ See Tentative Decision, ET Docket No. 91-280, 7 FCC Rcd. 1625 (1992)(LEO satellites).

²⁵ Pioneer's Preference Request, at 13. PageMart annexed the "detailed technical evaluation" from its petition for rulemaking to the preference request. Id. at 1 n.1.

Finally, the Commission's failure to review and assess the technical materials submitted with PageMart's preference request is illustrated by a glaring error in its Notice. The Notice states that in the absence of experimental test results for PIMS, the Commission cannot "clarify the technological differences, if any, between PageMart's scheme and existing cellular systems."²⁶ However, in PageMart's rulemaking petition, preference requests and comments, PIMS was expressly compared with and distinguished from cellular telephone systems in several important respects:²⁷ (a) PIMS uses far less scarce spectrum than cellular systems; (b) unlike cellular radio, PIMS uses all-digital transmission, 4-cell re-use and a micro/pico-cell architecture; (c) PIMS system design minimizes receiver size and battery drain, key problems with portable cellular handsets; (d) PIMS overcomes cellular radio's in-building performance limitations by use of office-cell "booster" radios; (e) PIMS is designed without cell-to-cell handoff in order to achieve enormous cost savings and message transfer prices competitive with landline networks; and (f) PIMS is designed with return link capacities for data messaging instead of full duplex voice transmission.

An experiment cannot "clarify" system design differences that are not only obvious technologically from the service description but were also expressly explained in detail by the applicant as key advantages of its proposal. Since this imperceptible error in the Notice indicates that the compressed decisional schedule and confused procedures in this docket have undermined the Commission's ability

²⁶ Notice ¶ 152.

²⁷ E.g., Petition for Rulemaking, at 3, 8, 9-10, 11-12, 14-15 & A4; Pioneer's Preference Request, at 9, 12-13.

to make reasoned, non-arbitrary judgments based upon a fair review of the record, PageMart asks that the Commission reconsider its tentative denial of PageMart's pioneer's preference request for PIMS.

II. THE RECORD IN THIS PROCEEDING DEMONSTRATES UNEQUIVOCALLY THAT PIMS FULLY MEETS THE COMMISSION'S PIONEER'S PREFERENCE STANDARD FOR "TECHNICAL FEASIBILITY"

The Commission has made clear that a showing of technical feasibility must establish that "a proposed new service or technology is viable."²⁸ The Commission's conclusion that PIMS is technically infeasible is erroneous as a factual matter on the present record. First, PIMS is both technically and commercially feasible today using current technology. Second, PageMart has already refuted in detail the asserted technical deficiencies argued by MTel, the only party to suggest that PIMS is not technically feasible, and MTel's arguments were not accepted in the Notice. Third, two significant and respected third-parties, Motorola and SFA, Inc., have expressly concurred with PageMart's feasibility showing.

A. PIMS is Technically (and Commercially) Feasible Today Using Currently Available, Off-the-Shelf Technology

From its initial rulemaking petition in February 1992, PageMart has made clear that the central technical advancement in PIMS lies in its "innovative combination" of existing technologies.²⁹ Since the key elements of PIMS—radiolocation, frequency reuse and miniaturized subscriber RF capabilities—are

²⁸ Preference Reconsideration Order, ¶ 12.

²⁹ E.g., Rulemaking Petition, at 6-9; Pioneer's Preference Request, at 13-14; PageMart Comments, at 1-9 and Exh. 1; PageMart Reply Comments, at 6, 8-10 & n.9.

already in use in different sectors of the communications industry, there is by definition a reality-proven technical feasibility to PIMS that cannot be controverted.

The essence of PIMS is massive frequency reuse, obtainable by bringing to the paging industry the frequency management techniques used by cellular mobile radio systems and taking those techniques one step further by utilizing an “adaptive architecture” of hierarchically sized cells. Radiolocation techniques have been developed and refined in numerous satellite and other Commission-authorized services. Miniaturized RF devices are already commercially available—such as MTel’s own credit-card sized paging equipment—and what PageMart and its cooperating equipment manufacturers have added is the revolutionary concept of incorporating the radio into a PCMCIA-standard computer card, thus permitting the novel and unparalleled convenience of “device-independent” messaging.

The brilliance of the PIMS system stems precisely from this liberal extension of existing technology in a manner no one has previously conceived.³⁰ PageMart’s June 16 Reply Comments in this docket, in fact, made clear that PIMS is not only technically feasible, but largely commercially feasible as well.³¹ As discussed therein, feasibility actually represents several different levels of proof:

- **Theoretical feasibility**, in other words a design or set of technical performance objectives which appear possible in that they do not violate any laws of physics. This level of feasibility is commonly demonstrated by a combination of technical narrative and computer modeling.

³⁰ PageMart has applied for patent protection for its innovative integration of these technical ingredients into a new communications system.

³¹ PageMart Reply Comments, at 8-10, 19-23 & Appendix A thereto.

- **Technical feasibility**, in other words that equipment can be built to function and meet performance specifications using either existing components (e.g., semiconductor devices) or components successfully prototyped.

- **Commercial feasibility**, in other words that equipment can be built in production volume and accordingly meet target cost/performance requirements and business objectives.

Although all of the Docket 92-100 pioneer's preference requests demonstrated "theoretical" feasibility, several appear to fall short of technical feasibility, since they rely on untested high-speed coding techniques to achieve the "advance" they claim as significant.³² PageMart's approach is significantly different. Its innovation lies in its system conception and design. "PIMS delivers the most data to the most subscribers in each market not by pushing the envelope of data modulation technique or speed to a point which can be accomplished today only in computer models, but rather by an innovative approach to system architecture."³³ PageMart's proposed initial data speed of 2,400 bps—as well as its "second step" speed of 4,800 bps—are lower than today's European ERMES standard. As a result, the PIMS subscriber transceiver unit is a low-power, low-cost, highly portable unit already in prototype on a PCMCIA Type II card. Virtually all the other parts of the network

³² For example, while MTel claims to have demonstrated feasibility through a combination of textbook citations and consultants' computer simulations, that is clearly only theoretical feasibility. Indeed, the application explicitly states that MTel's demonstration of technical feasibility must await the outcome of its 6-month-long, 7-step "Ongoing Validation Program." (MTel Technical Feasibility Demonstration, ET Docket No. 92-100, PP-37, at 18-21 (June 1, 1992)). Of course, even if that test is successful, the Commission will have to decide whether a three-transmitter network in Oxford, Mississippi adequately tests the network's robustness and ability to overcome the critical multipath and intersymbol interference challenges posed by RF-intensive and RF-hostile markets like New York City and Los Angeles, where demand is likely to be greatest.

³³ Reply Comments, at 9.

could be assembled today from “off the shelf” components and technologies, as was presented in detail in PageMart’s Docket 92-100 submissions (e.g., Appendix A hereto).

This singular approach to system design permitted PageMart to supply in its initial filing not only a thorough technical description of PIMS network architecture and system parameters, but realistic estimates of cost and market prices for PIMS service.³⁴ And in its June 16 reply comments, PageMart included a 26-page technical specification and a “parts list” for each of the equipment components that will comprise the base stations, geographic cells, building cells, office cells and subscriber units associated with PIMS service.³⁵ All of the individual PIMS network components have been selected from available equipment, and the PCMCIA-standard RF card is in prototype form with several manufacturers committed to its manufacture. Thus, while other parties to Docket 92-100 labor to prove theoretical feasibility for simulcast transmission speeds almost four times faster than the current 6,250 ERMES European paging standard, PageMart has devised a reuse-based system operating at 4,800 bps, using commercially available equipment, which offers

³⁴ Because PageMart’s PIMS system is based on commercially available equipment and conventional paging site operations, it is relatively easy to extrapolate costs to arrive at the 10¢ per 1 K bytes that was given in PageMart’s Rulemaking Petition as a very conservative estimate. For instance, assuming a 30X improvement over a simulcast system and an 8X improvement in data rate (1,200 to 9,600 bps) means that current paging system charges of 1¢ per character local alpha message could be reduced to 0.42¢ per 1,000 characters in a PIMS message, all other costs being held equal. Although PageMart recognizes that there will be greater infrastructure cost per data channel associated with the cell-based design of PIMS, even if operating and infrastructure cost were tripled, total cost would less than double (since technical cost is typically less than 20% of total costs) and a potential mature system’s operating target price of 10¢ per 1 K characters would be achievable.

³⁵ This portion of PageMart’s June 16 filing is annexed as Appendix A.

at minimum of a 10-time, and depending on market configuration as much as a 100-fold, increase in subscriber throughput.

B. PageMart's PIMS Proposal is Demonstrably Feasible on Each of the Technical Grounds Challenged in this Proceeding

On June 16, 1992, MTel formally opposed PageMart's pioneer's preference request, submitting in connection therewith a report by its engineering consultants which purported to establish that PIMS's four-cell reuse design and related system elements are infeasible. In its July 1 reply, PageMart refuted each of the technical claims presented by MTel. PageMart's July 1 technical showing is annexed hereto as Appendix B. Despite its consideration of technical feasibility, the Commission's Notice does not accept any of the MTel feasibility arguments. No party other than MTel challenged the technical feasibility of PIMS. Eliminating the Notice's defective conclusion on experimental test results therefore leaves the Commission with no record basis on which to find that PIMS is technically infeasible.

C. Independent Authorities Confirm the Clear Technical Feasibility of PageMart's PIMS Proposal

PageMart's demonstration of technical feasibility is supported, in addition, by two highly relevant objective tests.

First, Motorola, Inc., a principal manufacturer of network and subscriber paging equipment, has reviewed the PIMS proposal and has concluded that all of the network equipment and subscriber module functionalities for the service are available today or technically feasible. Motorola reports that:

We have had an opportunity to review the PIMS system design and have concluded that Motorola could develop and manufacture both the network equipment and the subscriber

receiver/transmitter unit using a combination of existing and emerging technologies. The system elements utilized in the design would require a base station unit containing multiple receivers for the return link; a trunking control unit; and a subscriber unit containing a receiver and transmitter. All of the network equipment technology is essentially available today; however, additional development will be necessary to ensure against receiver desensitization in harsh RF site locations. The subscriber receiver/transmitted unit will require further development if it is to use the PCMCIA card package. We believe such a "pager card" to be feasible.

Letter from Motorola, Inc. to PageMart, Inc., July 13, 1992, at 1 (Appendix C hereto) (emphasis supplied). This endorsement by a major equipment manufacturer of its ability to develop and supply the technical components of a PIMS network is a conclusive confirmation of PIMS' technical feasibility.

Second, SFA, Inc., a leading telecommunications engineering consultant, has examined the PIMS system specifications and has likewise concluded that each of the elements of PIMS is technically feasible. SFA's Report is Appendix D hereto. As SFA states:

SFA has analyzed PageMart's proposed Personal Information Messaging Service (PIMS) to determine whether PIMS is technically feasible. Each major design issue was evaluated, including frequency reuse, system coverage, interference, signalling protocol, system capacity and use of current technologies. Based on this review, SFA concludes that PIMS is a technically and commercially feasible system offering advanced data communications capabilities. SFA has also determined that there are no technical design issues in the proposal for which empirical and implementation solutions do not already exist in engineering literature or in real-world communications experience. The fundamental design of PIMS is sound and workable as proposed in the Technical Appendix to PageMart's February 1992 Petition for Rulemaking and March 1992 Pioneer's Preference Request.

Appendix D, at 1 (emphasis supplied). This thorough technical evaluation by an independent and respected communications engineering consultant is an equally conclusive confirmation of PIMS' technical feasibility.

III. UNDER THE CRITERIA APPLIED TO MTEL'S REQUEST FOR A PIONEER'S PREFERENCE, PAGEMART HAS CONCLUSIVELY DEMONSTRATED TECHNICAL FEASIBILITY AND ALL OTHER ELEMENTS OF A PIONEER'S PREFERENCE

The Commission's Notice tentatively grants a pioneer's preference to MTel's proposed Nationwide Wireless Network ("NWN") system for two-way data messaging. Under the same criteria applied to MTel's application, PageMart merits a pioneer's preference for its PIMS innovation.

As to feasibility, MTel's NWN service is premised on simulcast transmission speeds of 24,000 bps, which no existing technology is capable of supporting. NWN likewise relies on a coding and modulation scheme which has never been tested in connection with any service. The Notice suggests that MTel's "field tests" demonstrate technical feasibility, but MTel's June 1, 1992 feasibility "demonstration" offered only computer models, not test results, and its computer simulations were limited to 3,000 baud transmission.³⁶ Essentially, what MTel offers is a prediction, supported by limited mathematical equations, that it may be able to develop

³⁶ MTel's June 1, 1992 "Technical Feasibility Demonstration" concedes that 3,000 baud is "a practical limitation on simulcast operations" (p. 7). MTel is in the process of a "validation program" for verifying use of orthogonal spacing to subdivide a 50 kHz channel using multi-carrier modulation, but its technical report stated that MTel "was unable . . . to model such a scheme, and cannot comment on its performance" (*id.* at 8-9 & n.22). Indeed, MTel indicates that "radio experimentation in the field will be required to confirm that orthogonality can be maintained in a simulcast environment" (*id.* at 9 n.22). In a subsequent June 24, 1992 submission, MTel enclosed results of field tests that never established the technical feasibility of the critical system component, namely the 24 kpbs receiver. The only test made was of combining eight channels in a rural test area to be "received" by an expensive laboratory test instrument, a spectrum analyzer.

equipment to support baud rates six times that of the most-advanced paging standards known to the industry. If the Commission's preference standard of technical feasibility is satisfied by the submission of computer models of lower-level technology predicting the viability of equipment not yet available, accompanied by an admitted inability to model the key technical feature of the proposed innovation, PageMart's proposal to apply existing communications technologies for frequency re-use and radiolocation to wireless data messaging is by definition technically feasible.

PageMart's PIMS proposal meets all of the remaining criteria applied to MTel as well. First, PIMS supplies "added functionality" to existing paging and two-way mobile data services by providing substantial message throughput capabilities and reducing both system and subscriber unit costs.³⁷ Second, PageMart has developed "new use of spectrum" by proposing a wireless service for lengthy messaging using an open protocol platform and device independence.³⁸ Third, PageMart has generated "changed operating or technical characteristics" by its extension of cellular re-use design into the realm of micro and pico cell system architecture.³⁹ Fourth, PIMS provides "increased spectrum efficiency" by offering at least a 10-times, and depending on market configuration as much as a 100-fold, increase in message delivery capacity.⁴⁰ Fifth, PIMS supports "increased speed or quality of information transfer" by increasing throughput with frequency re-use instead of simulcast

³⁷ Notice ¶ 147; see Rulemaking Petition, at 16-17; Pioneer's Preference Request, at 14.

³⁸ Notice ¶ 147; see Rulemaking Petition, at 13-15; Pioneer's Preference Request, at 9.

³⁹ Notice ¶ 147; see Rulemaking Petition, at 14; Pioneer's Preference Request, at 5.

⁴⁰ Notice ¶ ¶ 147, 149; see Rulemaking Petition, at 14; Pioneer's Preference Request, at 5.

transmission, thus reducing subscriber equipment costs and dramatically reducing power requirements.⁴¹ Finally, PIMS provides “reduced cost to the public,” because both equipment costs and service costs are far below projected costs for alternative message delivery systems, including MTel’s.⁴²

Under the same standards the Commission applied to MTel’s proposal, PageMart therefore merits a pioneer’s preference for having developed and demonstrated significantly improved message throughput capacities, submitted an innovative proposal based upon this improvement that will result in new service functionalities and reduced costs being made available to consumers, and developed the technical system design necessary to implement its proposal. Notice ¶ 149.

⁴¹ Notice ¶¶ 147, 149; see Rulemaking Petition, at 13-14; Pioneer’s Preference Request, at 9-10.

⁴² Notice ¶¶ 147, 149; see Rulemaking Petition, at 16-17; Pioneer’s Preference Request, at 13.

CONCLUSION

For all these reasons, the Commission should grant this petition for reconsideration and should tentatively award PageMart a pioneer's preference for its PIMS innovation.

Respectfully submitted,

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