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JUN 29 1992

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

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of )  
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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

To the Commission:

ORIGINAL  
FILE

REPLY TO OPPOSITIONS TO AND COMMENTS ON  
GLOBAL ENHANCED MESSAGING VENTURE PROPOSAL

GLOBAL ENHANCED MESSAGING VENTURE

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## SUMMARY

Global Enhanced Messaging Venture hereby replies to the comments and oppositions of PageMart, Inc., Dial Page, L.P., Mobile Telecommunication Technologies Corporation, and Paging Network, Inc. with respect to its Demonstration of Technical Feasibility and Request for Pioneer's Preference in this docket.

In response to Mtel, Global points out that it is constrained by patent registration requirements from disclosing publicly exact details of its new technological advancements. But it has described them in this docket in what it believes to be the necessary detail and stands ready to provide the Commission staff with complete information on a confidential basis. Global has shown also that, unlike the Alpha-Tone<sup>tm</sup> format which is incorporated in its GEM proposal, alternative compression schemes cited by Mtel are not suitable for small messages such as are found in paging. Even considering overhead requirements, GEM will produce a 30% or greater speed improvement. Also, the Pagentry unit which Global plans to couple with GEM service is, contrary to Mtel's suggestions, a full-function device which can generate lower-case letters and all standard characters.

In response to PageMart's cursory comments, Global shows that it proposes a general market service with sharply markedly speed and efficiency than current paging offerings and also the availability of various specialized services,

including reply messaging and facsimile reception. In fact, its proposal meets the "advanced" messaging service criteria posited by PageMart. The Pagentry unit is, contrary to PageMart's statements, small, light, and quite versatile.

In response to PageNet, Global shows that GEM service would offer increased speed of transmission and a novel format which would enhance spectrum efficiency. GEM would permit the provision of desirable new services. Contrary to PageNet's allegations, the allocations plan advanced by Global would be efficient, and the proprietary GEM format would not pose any threat to fair pricing and robust competition.

Global supports the suggestion of Dial Page that allocations and grants of pioneer's preferences may be made for a number of different AMS proposals which are found to be technically feasible. Proposals which would not exhaust the reserve spectrum should be favored, so that multiple new technologies may be authorized.

GEM would be markedly different from any service now in the marketplace, and it requires a dedicated allocation of spectrum to realize its potential. GEM has an innovative design utilizing state-of-the-art hardware and software techniques. Notwithstanding the comments and oppositions filed by parties seeking to conserve spectrum for their own proposals, these techniques, along with higher transmission speeds and value-added service offerings, justify a spectrum allocation and warrant a pioneer's preference.

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To the Commission:

REPLY TO OPPOSITIONS TO AND COMMENTS ON  
GLOBAL ENHANCED MESSAGING VENTURE PROPOSAL

Global Enhanced Messaging Venture ("Global"), a joint venture of Message Center Beepers, Inc. (Message Center) and RTS Electronics, Inc. (RTS), hereby replies, by its attorneys, to the following pleadings which have been filed with respect to its Demonstration of Technical Feasibility and Request for Pioneer's Preference in this docket: Comments of PageMart, Inc. ("PageMart"), Comments of Dial Page, L.P. ("Dial Page"), Opposition of Mobile Telecommunication Technologies Corporation ("Mtel"), and Opposition to Pioneer Preference Requests of Paging Network, Inc. ("PageNet").<sup>1/</sup>

Summary of Global Proposal

1. Global's showing of technical feasibility proposes the allocation of channels in the 930-931 Mhz paging reserve band for provision of Global Enhanced Messaging (GEM), an enhanced narrowband data and paging service. As described

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<sup>1/</sup> This pleading is supported by a facsimile of the declaration of a principal of one of the Global joint venturers. The original will be filed with the Commission as a supplement.

in detail in Global's proposal, GEM will introduce substantial technical and service innovations to the paging field. GEM will utilize a unique and advantageous radio paging transmission format. The GEM format will support a data transmission speed of 6,250 bits per second, considerably faster than the 2,400 bit-per-second maximum currently in commercial service.<sup>2/</sup> That speed improvement will be further enhanced through techniques which reduce the amount of information which must be transmitted in order to send certain types of paging data.

2. These improved transmission techniques may be utilized by a set of new paging receivers which provide two-way message communication capabilities, not available on any paging receiver in use today. The proprietary Alpha-Tone<sup>tm</sup> paging format will be incorporated into the initial units. A variation of that format will be used for RF transmissions to provide the wireless portion of the GEM service. GEM partner RTS holds the proprietary rights to the design of those receivers. It will make them available for use by the Joint Venture and will also make them available, on a nondiscriminatory basis, through license arrangements to other companies which wish to provide GEM services.

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<sup>2/</sup> Global's original submission inadvertently referred at one point to a transmission speed "in excess of" 6,250 bits per second.

3. The net result of these technological innovations is a substantial increase in the subscriber capacity of a 25 Khz radio paging channel. The number of alphanumeric subscribers accommodated on a channel could be thirty percent greater than would be achievable by merely increasing the speed at which alphanumeric pages are transmitted.

4. Some of these technological advances could, after development at 900 Mhz, be readily adapted for use in other frequency bands, where they will be capable of increasing the capacity and expanding the service capabilities of channels already devoted to paging. These techniques thus promise the eventual widespread conservation of paging spectrum, permitting the provision of additional service without the allocation of new frequencies.

5. GEM utilizes innovative techniques which facilitate a number of advanced services. It will support a two-way, hand-held message communications unit which comprises a wireless receiver and a landline transmitting device. The unit permits efficient receipt of alphanumeric paging information along with the capability to send responses to the caller via the landline network. Providing communications in this manner reduces the over-the-air bandwidth requirements for a two-way service by moving a portion of the transmission to the landline network. This hybrid two-way service fits a number of communications needs and utilizes a lower-cost paging receiver than

could be used in a two-way wireless system. A GEM system will also, however, support traditional paging receivers which can receive tone-only, numeric, and alphanumeric pages. GEM will also support the transmission of binary data for reception by laptop, palmtop and other portable computing devices.

6. GEM provides the ability to receive and examine on a hand-held paging receiver high-priority facsimile messages containing graphical and textual data. It also provides the ability to receive and examine lower priority facsimile messages via retrieval over the landline network, thereby conserving valuable bandwidth.

#### The Comments and Oppositions

7. Dial Page does not oppose Global's proposal, and in fact suggests that GEM and other spectrum efficient services proposed could all be accommodated within the band. PageMart, PageNet, and Mtel take issue with Global's demonstration of technical feasibility and oppose its request for a pioneer's preference. As shown below, their arguments ignore or misconstrue Global's proposal.

#### Reply to Opposition of Mtel

8. Mtel argues that GEM would not be an innovative service, but rather a pedestrian extension of existing services.<sup>3/</sup> It takes issue with Global's claims concerning

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<sup>3/</sup> Mtel refers to GEM service in the introduction of its Opposition as encompassing only high-speed alphanumeric  
(continued...)

format improvement and denigrates Global's compression achievements. Finally, it questions the utility of the GEM portable terminal unit and its functionality as a facsimile display device. As shown below, Mtel is wrong on all counts.

9. Mtel faults Global for not providing supporting documentation to demonstrate that it offers an improvement over the error control and interleaving capabilities of the ERMES format (Opposition, pp. 4-5).<sup>4/</sup> Mtel has overlooked the fact that Global venturer RTS has a pending patent application concerning its innovative techniques (See Global filing at pp. 34-35, para. 42). As noted in footnote 9 of Global's filing:

Because of the pending patent application, the Joint Venture is limited as to the extent of detail which it may disclose concerning the proprietary technology and features of the devices. The Joint Venture has, however, here provided sufficient information concerning the nature of the technology and features and detailed information concerning the services which can be provided to show the technical feasibility of GEM service.

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3/(...continued)

paging. As shown in Global's submission, however, the service would also include transmission of numeric, data, and graphical messages.

4/ Mtel is quite wrong in suggesting that the core of its proposal is the packaging of an "Ermes pager" with a land-line terminal (Mtel Opposition, page 4). Global proposes use of the extensively tested ERMES modulation technique along with a coding format 30 percent more efficient than ERMES for alpha-numeric paging. Paging subscribers would for the first time have easily accessible terminals.

Global can hardly be faulted for stopping short of disclosing technical information which could jeopardize RTS' pending patent application. GEM would actually effect a reduction in the information which must be transmitted in a page of 30 to 40 percent or more, but RTS and Global are not at liberty at this time to publicly disclose the methodology. GEM is, however, prepared to back up its claims by releasing information from the patent application for inspection by the Commission's engineering staff upon request, subject to the confidentiality procedures set forth at Section 0.459 of the Commission's rules with respect to materials falling within the purview of Section 0.457(d) of the rules.

10. Mtel states that it has itself "experimented with encoding schemes that achieve 50 percent compression of normal text". (Opposition, p. 5). Global is not just experimenting. The system it proposes is already achieving the claimed compression with the use of small, low-power, self contained, battery operated, transmitting units such as one which has been given to MTEL for evaluation.

11. Mtel cites (Opposition, fn. 15) some compression techniques announced by other companies. It submits as Attachment A to its Opposition a letter from Mike Weiner, an officer of a company, with an accompanying journal article concerning

such compression techniques.<sup>5/</sup> The techniques described, however, are not comparable to that developed by RTS and proposed for GEM use by Global.

12. RTS has been involved in the use of data compression since work the company officers conducted as early as 1973 in the area of compression of facsimile documents for transmission through data networks. Although there are many compression schemes capable of reducing text to 50%, they typically can achieve this result only over large messages whose size is larger than normal alphanumeric messages. In some cases, compression is achieved by sending a "dictionary" along with the compressed data. This methodology also is efficient only for large messages. The distinctive advantage of the Alpha-Tone format is that it achieves its compression ratio even with small messages, of the type which are generally the subject of alphanumeric pages.

13. Alpha-Tone performs its compression of textual messages "on the fly" as it transmits messages to a host paging terminal. It performs data compression -- for paging, message maintenance, fax message creation and transmission, group paging, canned text utilization, operations as a data terminal, TDD unit, alarm/reminder clock, calculator, as well as all of

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<sup>5/</sup> The letter is not on letterhead and does not identify the corporate affiliation of the writer, but Mtel states that the letter reports on compression technology developed by a company named MicroLitics.

the other functions noted in Exhibit 1 hereto, in less than 4K of scratch pad memory. The letter from Mr. Weiner claims that their technology needs very little scratch-pad memory. However, data compression is only one small function of the very sophisticated, feature-rich, hand-held Pagentry telecommunication device which uses very little RAM. Pagentry employs state-of-the-art surface mount technology custom chips, as well as other techniques employed in consumer electronics products, combined with software designed by a team with extensive experience in the development of telecommunication systems.

14. Mr. Weiner's letter indicates that his company's exclusive techniques have been used to compress the Pocket Flight Guide from 5.5 Mb to 300K. Such compression of large masses of information is impressive. In fact, some of the staff members of RTS Electronics were responsible for fitting an 80,000 word dictionary into a hand-held spelling checker made by Franklin Electronic Publishers several years ago, a comparable feat. But, once again, the compression of large files does not present the same problems as the compression of small alphanumeric messages. Alpha-Tone yields an excellent compression ratio for alphanumeric paging messages and is capable of incorporating even more improved mechanisms when they become available.

15. As to the Journal article, Global agrees that various compression techniques exist. Yet to date no pager has

incorporated such mechanisms. The GEM proposal is the first service which will employ such techniques in a commercial pager. On Page 2 of the article it is stated that the literary phrase "It was the best of times, it was the worst of times" can be compressed, via the Ziv-Lempel type scheme known as A1, from 51 bytes down to 36 bytes, a reduction of 29.5 percent. RTS Electronics executed the Alpha-Tone compression mechanism on this same text message, reducing the 51 bytes to 29.5 bytes, a 42.1% reduction. Even with coding format overhead bits considered, the GEM format would transmit this message at least 30 percent more efficiently than in POCSAG or ERMES.

16. Mtel argues further that:

...because information encoding does not lessen usage of overhead bits, a 30 percent compression of text would not increase efficiency by "at least 30 percent," as the Joint Venture asserts.

In fact, however, GEM text compression, achieved with the Alpha-Tone format, exceeds 30 percent, but with overhead bits considered the efficiency claim is reduced to about 30 percent. GEM incorporates a paging format which would permit "overall channel loading capabilities at least 30% greater than those which would be achievable by only increasing data transmission speeds" (GEM filing, p. 28, para. 32). Stated another way, "there is a 30% to 40% improvement in channel loading using GEM over what would have been achieved solely by increasing the channel speed to support the ERMES format" (GEM filing, p. 39,

para. 49). Thus, even considering the overhead factor, GEM will have a 30% advantage.

17. Mtel surmises, incorrectly, that the Pagentry terminal cannot generate lower-case letters. (Opposition, p. 5). Based on that incorrect premise, it speculates that "Alpha-Tone is approximately equivalent to the now obsolete Baudot 5 bit teletype code" and accomplishes a reduction in the bit level by depriving the user of a full alphabet. (Opposition, pp. 5-6, fn. 17).

18. The answer in brief: the Alpha-Tone format permits the display of upper and lower case letters, and in fact every ASCII character.<sup>6/</sup> While there is not a dedicated shift key on the Pagentry keyboard, upper and lower-case shifting has been accomplished by a command, as shown at Page 29 of the Pagentry users manual (Version 2), submitted as Attachment 2 to Global's filing. Appended hereto as Exhibit 2 are pages from the Version 3 Pagentry manual which is currently being edited. They show that entry has been simplified and that a user now need only press the Letters key twice to switch back and forth between upper and lower case letters. In addition, the Symbols command allows the user to insert any desired printable character into a message being prepared. Pagentry

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<sup>6/</sup> If Alpha-Tone used only a five-level code, the amount of compression would be fixed at 28.57 percent. The format achieves a varying 30 to 40+ percent compression ratio because the level of compression varies depending upon the content of the data transmitted.

supports messages which span all printable characters in the ASCII character set and the pager is capable of displaying all of these characters, as is true in POCSAG receivers today. The Alpha-Tone patent application clearly indicates that the full ASCII character set is supported under this protocol.

19. Alpha-Tone was developed from the analysis of hundreds of thousands of alphanumeric messages which were given to Real Time Strategies on disk by several major carriers when it was developing the technique. In fact, a request for submission of alphanumeric messages to analyze appeared in the Telocator Bulletin of November 9, 1990 during the analysis and testing of the technique (See Exhibit 3 hereto). Alpha-Tone was thereby developed through the analysis of typical paging messages. It requires very little storage and time to execute the compression and decompression algorithms. It has been optimized with a view toward typical paging messages.

20. The article shows that the best compression ratios with conventional compression techniques are achieved in larger files. As stated in Section 6, page 14, "...the cross-over from lower compression to higher occurs after about 70,000 characters!" The best compression techniques yielding high compression ratios are not applicable to paging messages, which typically range from 40 to 400 characters. Alpha-Tone achieves significant compression results for these messages while balancing against compression speed and storage requirements.

Page 23 of the article, in the section describing A1, speaks of storage requirements of 10,000 bytes, while page 25 states

...textual substitution is especially effective on small files. On 11,000-byte program source files, for example...

An 11,000 byte file is far from small in the paging domain, and a requirement of 10,000 bytes would be prohibitive in a hand-held device.

21. Mtel also questions the efficacy of the Pagentry unit. It notes that the unit would permit the subscriber to respond via the landline network and suggests that this would be an inconvenience (Opposition, p. 3). Sending responsive data via the landline network is an inconvenience today, however, in large measure because there is no easy way to input data. A combined pager/input device puts a response unit in the palm of the recipient of a page.

22. Mtel also attacks the quality and functionality of the Pagentry keyboard and display, with respect to alphanumeric messages and facsimile readout (Opposition, p. 6). It claims first in this regard that the series of illustrations included in Global's filing at pages 19 through 26 "indicate a notably inferior keypad and display". The drawings, however, are simplified representations of message movement using the GEM system. They were not intended to depict the unit's keyboard and display capabilities. Those extensive and innovative capabilities are described in detail in the supporting

materials. Information concerning the existing Pagentry I unit was presented by Global in its filing. But Models 100 and 200 support normal typewriter-type keyboards as well as a multi-line display. As stated in the filing, Model 100 displays alphanumerics, while the Model 200 has full graphic capabilities. In particular, the subscriber will find the Model 200 to be a useful tool for receiving urgent facsimile messages and triaging less urgent ones. With the use of sophisticated windowing techniques it will be relatively easy to scroll a fax message. There are obvious limitations in the use of the device for the review of lengthy messages, but the advantages in cost, size, weight, and functionality will result in a useful device for many applications.

Reply to Comments of PageMart

23. PageMart deals with Global's proposal cursorily in four sentences at pages 8 to 9 of its Comments. It questions the innovativeness of GEM, claiming that the compression claimed is only slightly higher than that currently available. It charges also that the Pagentry devices are capable of only a single, specialized service and are "extremely large and bulky".

24. Global proposes a general market service with overall greater efficiency than current paging offerings and also the availability of various specialized services, including reply messaging and facsimile reception. In fact,

its proposal meets all of the "advanced" messaging service criteria posited by PageMart (see PageMart Comments, p. 2, fn. 3). PageMart's criticisms are easily answered. Current state-of-the-art paging speed in this country is 2,400 bps; Global proposes to implement 6,250 bps paging. This is hardly a "slightly higher" speed. Moreover, PageMart has ignored a prime distinction of the GEM proposal, the use of the highly efficient Alpha-Tone format to enhance the greater speed.

25. The Pagentry devices support a multiplicity of services, as stated in Global's filing and depicted in the extensive materials submitted as Attachment 2 thereto. The device measures 3" x 5" x 3/4" and weighs 5.0 ounces.<sup>1/</sup> It is a pocket-size unit which fits in an inside jacket pocket or in a pocketbook. Global is at a loss as to how PageMart reached its "extremely large and bulky" conclusion.

Reply to Opposition of PageNet

26. PageNet opposes every other party requesting a preference. With respect to GEM, it argues that the service would be cumbersome and would not enhance mobile communications. It contends that GEM has not claimed enhanced spectrum efficiency or increased speed of transmission. PageNet argues that the return link through the landline network could be provided under the existing rules. It also says that its own VoiceNow<sup>sm</sup> service would be more spectrum efficient. Finally,

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<sup>1/</sup> See Global filing at page 12.

it worries that the proprietary GEM format may stifle competition.

27. PageNet is the proponent of the astoundingly inefficient VoiceNow service. It wants to use up the entire megahertz of reserve space in order to speed up voice paging. The use of binary data for paging is inherently much more efficient than voice paging. PageNet is able to propose an extraordinarily high increase in voice transmission speed only because voice is so very inefficient a mechanism to convey information. Its percentage increase in transmission speed for voice paging does not begin to offer the public interest benefits of the kind of improvement Global has proposed for data paging.

28. PageNet alleges that Global does not:

claim to offer enhanced spectrum efficiency, increased speed of transmission, reduced costs of service or other advancement[s] the Commission established as criteria by which it will measure pioneer's preference requests.

(PageNet Opposition, p. 11). But PageNet has somehow overlooked the bulk of Global's filing, which addresses in detail just these points. The increased speed of transmission and enhanced spectrum efficiency which will result from GEM service are the heart of its proposal. These efficiencies may be expected to result in a competitively priced service. Moreover, the advancements in service offerings which are possible

with the Pagentry devices will meet clearly defined public needs.

29. PageNet focuses on the dial-up return capabilities of the Pagentry unit and suggests that a mobile subscriber might as well find a telephone and call the paging party back (PageNet Opposition, p. 12). It does not recognize that the return message can itself be a radio page back to a mobile unit. Or the return page can be a facsimile message which may be left at an unattended machine.

30. At page 12 of its Opposition PageNet states that "GEM's proposal mirrors in significant respects proposals it has presented to the industry sporadically over the past few years" and concludes that "[t]he market's reception of GEM's service concept has been cool at best". No basis is provided for these statements. Global was formed recently for the purpose of advancing the GEM proposal in this proceeding. It has presented no prior proposals. Nor have the joint venturers in Global previously make proposals similar to the GEM proposal. The only preexisting element in the GEM proposal is the use of a Pagentry device, and the specific devices proposed would have capabilities far beyond those now in the marketplace. GEM is a newly proposed service which offers the very features which PageNet summarily says that it does not, including greatly enhanced alphanumeric service, substantial spectrum efficiency, improved functionality, and innovative value-added, RF-based

enhancements. PageNet perhaps has Global confused with some other company and GEM with some other service in this respect.

31. PageNet also takes issue with Global's allocations plan for GEM. Global has proposed the allocation of three nationwide and three regional channels. PageNet assumes incorrectly that the nationwide service would be offered on an inefficient nationwide simulcast basis, reducing system capacity. While Global proposes that the "nationwide" channels would support true nationwide simulcast service or multi-regional service for subscribers which desire it, they will also support zoning and a roaming capability, so that subscribers' units may be paged wherever they are currently located through selective activation of network transmitters.

32. Finally, PageNet charges that the use of the proprietary Alpha-Tone signalling protocol could result in a non-competitive market with one source of supply and no economies of scale (PageNet Opposition, pp. 13-14). GEM would, however, be in use on three nationwide and twelve regional systems with every expectation that it would spread to other paging systems in various services. Yet it would be only one of numerous competitive nationwide services. Global will of economic necessity license use of its proprietary technology at prices which foster competitive service. It should be noted also that GEM paging receivers are not limited to Pagentry type devices. Traditional tone-only, numeric, and alphanumeric

display pagers operating in the high-speed GEM paging format will also be supported (see Global filing, pp. 44-45).

Reply to Comments of Dial Page

33. Dial Page supports allocations and grants of pioneer's preferences for as many different AMS proposals as are technically feasible. It favors proposals which would not consume a great amount of spectrum, suggesting that all of them to date could co-exist in the band. It opposes the proposals of Pagemart, PageNet, and Freeman as consuming too much frequency space in terms of potential benefits, and it opposes Metriplex as an imitator of its own acknowledgment paging proposal. Dial Page suggests a channelization proposal which could accommodate all of the proposals it favors, although not always with the number of channels requested by the proponents.

34. While Global does not believe that GEM service may be pigeon-holed as readily as Dial Page suggests, it subscribes to the proposal that multiple new technologies could and should be authorized. By eliminating the proposed services which would consume unreasonably great amounts of spectrum, virtually every proposal which the Commission finds promising may be accommodated. The public can then sort out the services.

Conclusion

35. Global proposes a service markedly different from any now in the marketplace. That service requires a dedicated allocation of spectrum to realize its potential. GEM has an innovative design utilizing both state-of-the-art hardware and software techniques. The combination of these techniques, the higher transmission speeds, and the value-added service offerings justify a spectrum allocation and warrant a pioneer's preference.

Respectfully submitted,

GLOBAL ENHANCED MESSAGING VENTURE

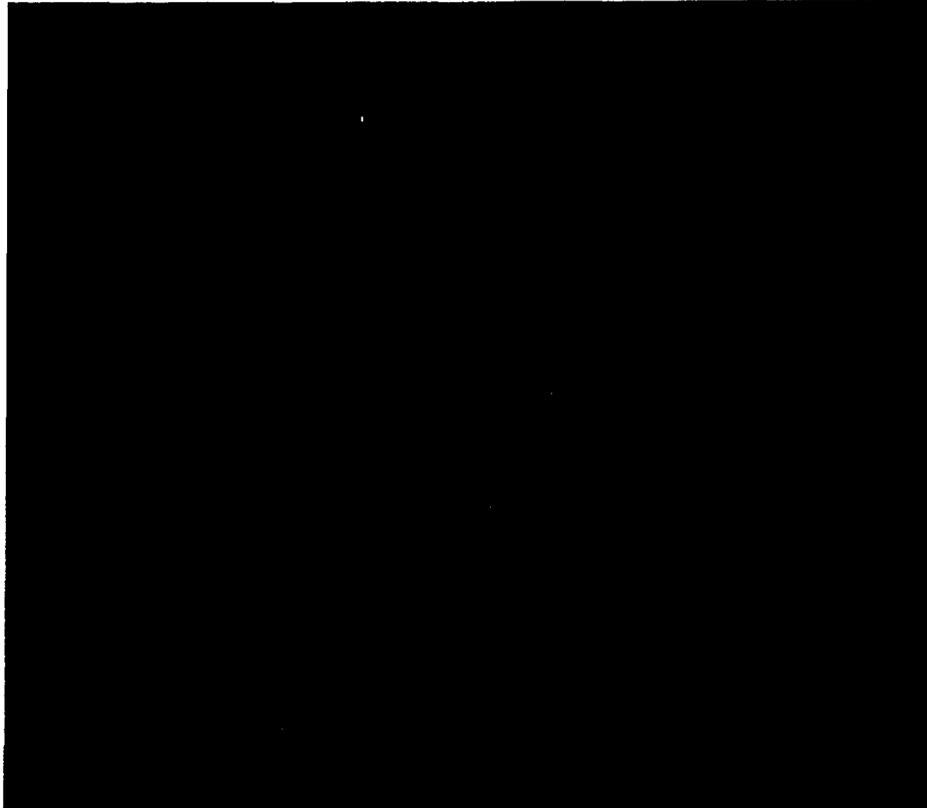
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**PAGENTRY™**



**Hand-Held Alphanumeric Page Entry  
Fax Transmission  
Data Terminal  
Electronic Mail  
Telecommunications Device for the Deaf  
Telephone Directory  
Calculator  
Alarm Clock**

## INTRODUCTION

Pagentry™ (pronounced like "pageantry") is a comprehensive Message Entry and Telecommunications center which fits in your pocket. The 3 inch by 5 inch, 5 ounce unit maintains a directory of names and telephone numbers of hundreds of companies and individuals who you communicate with most often. You may enter and save textual messages at any time. Whenever you wish, you may connect Pagentry to a telephone line via an RJ11 connector or an optional acoustic coupler. The text messages may then be transmitted to Radio Pagers (beepers) capable of alphanumeric (textual) display; to facsimile machines; to remote computers or remote Pagentry devices as Electronic Mail; or to Telecommunication Devices for the Deaf (TDD devices).

In addition, Pagentry can receive telephone calls and perform automatic Electronic Mail reception or interactively communicate electronically with the calling device. And, all Pagentry information may optionally be backed up to or restored from a Personal Computer!

The unit has more than 100 built-in functions to support the creation, modification, storage and transmission of information. It also provides the mobile individual with other capabilities which are often needed by people on the go.

Pagentry offers a range of functions:

- (1) Sends alphanumeric messages to radio pagers
- (2) Sends fax messages
- (3) Performs as a data terminal
- (4) Sends and receives electronic mail
- (5) Performs interactive communications with other Pagentry units
- (6) Acts as a Telecommunications Device for the Deaf (TDD)
- (7) Acts as a Touch Tone dialer to retrieve Voice Mail and Telephone Answering Machine messages
- (8) Backs up and restores all internal information to a Personal Computer (PC).

You may enter information into Pagentry at any time. If you shut off the unit, it remembers everything which was previously entered. You may type in messages to be sent at any time and later send these messages to remote receivers.

Pagentry can store more than 28,000 characters of information. This storage is used for permanent data such as names and telephone numbers, as well as for temporary information such as radio pages and fax messages which are to be sent.

## DIRECTORY

You never need to remember telephone numbers for pagers, fax machines, remote computers and other devices to which you will connect. Pagentry maintains a Directory in which you store the names, general information and all telephone numbers you will require. Once this is stored, you need only refer to a name in order to send a message to a beeper, a fax machine, a remote Pagentry unit, or to reach a remote data terminal, TDD device, computer, answering machine, or voice mail system.

## GROUPS

If you often send the same message to many individuals, you may create a Group. A Group is a list of Directory names which are to receive a common message. As an example, the Directory may contain the names of individuals of the same company. If you wish to send a radio page to remind all company members of an important meeting, you may create a Group and address the message to the Group name rather than to each individual. The radio page message or fax will then be delivered to each individual.

## PAGING

You may enter the names of individuals, companies and Groups which are to receive alphanumeric radio pages. You may enter one to hundreds of messages at a time. The messages are stored in Pagentry memory until you are ready to transmit them.

When you are ready to send pages, you connect Pagentry to a telephone line via its RJ11 telephone connector. In order to utilize Pagentry from a pay telephone, you may utilize an optional acoustic coupler.

Pagentry transmits messages to Paging systems in one of two ways. The unit can utilize the Paging Industry standard digital communications protocol known as the TAP (Telocator Alphanumeric Paging) protocol in order to reliably send its paging messages.

In addition to TAP, Pagentry introduces to the paging industry a brand new protocol known as Alpha-Tone™. This protocol represents alphanumeric messages as a group of touch tone signals. Because of the design of Alpha-Tone, an 80-character alphanumeric message may be sent in less time than an average numeric paging customer takes to send a page. Alpha-Tone can operate on the same telephone lines which are used by numeric paging customers. There is no need to reserve a special telephone number for alphanumeric paging callers, if the Alpha-Tone capability of Pagentry