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

**FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY**

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-7140, RM-7175, RM-7617  
RM-7618, RM-7760, RM-7782  
RM-7860, RM-7977, RM-7978  
RM-7979, RM-7980

PP-36

**ECHO GROUP L.P.**  
**PETITION FOR RECONSIDERATION**

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**Dated: September 14, 1992**

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### Summary

Echo Group L.P. ("Echo") submits this Petition for Reconsideration of the Tentative Decision denying Echo's request for a pioneer's preference.

First, the Commission erroneously assumed that Echo had not demonstrated the technical feasibility of its proposals. Echo, in fact, did file such a demonstration in the form of a "Progress Report" with extensive appendices. The Commission failed to consider these materials in reaching its Tentative Decision.

Second, Echo's Progress Report and other filings demonstrate that Echo's MDRS technology is both innovative and feasible. MDRS is a patented technology that transmits data in a high-speed, low-cost manner to provide a full-duplex (real time), two-way data messaging service employing high-efficiency but relatively low-cost base station and end-user equipment. Echo has already been approached by several major communications entities interested in implementing MDRS.

Third, Echo's proposal more than meets the standards identified by the Commission in tentatively awarding pioneer's preferences. MDRS is an innovative technology that has demonstrable service applications. Further, its feasibility has been tested and confirmed,

and Echo has shown that it has the technology to implement MDRS. Moreover, a nationwide preference should be awarded to Echo. Implementing MDRS will be most beneficial through the economies of scale and variety of services that would be available on a nationwide basis. Such a preference would also further the Commission's goal of promoting competition.

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PETITION FOR RECONSIDERATION

Echo Group L.P. ("Echo"), by its counsel, hereby files this Petition for Reconsideration of the Commission's Tentative Decision to deny Echo's request for a pioneer's preference released August 14, 1992 in the above-captioned proceeding ("Tentative Decision").

The Commission's tentative conclusion was based solely on the erroneous assumption that Echo had not filed reports with the Commission demonstrating the technical feasibility of its proposal. Tentative Decision at ¶ 161. Echo, however, had in fact filed its technical feasibility showing -- in the form of a "Progress Report" containing two appendices<sup>1</sup> -- on the day

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<sup>1</sup> See Mobile Data Radio System Progress Report, filed June 1, 1992 ("Progress Report").

that technical showings for mobile data and advanced paging pioneer preference requests were due.<sup>2</sup> Echo initially requested confidential treatment for the appendices to its Progress Report (not the Progress Report itself), but the Office of Engineering and Technology denied the request for confidentiality and Echo subsequently refiled the appendices in their entirety on June 5, 1992. See 47 C.F.R. § 0.459(g).<sup>3</sup>

In short, the Commission's Tentative Decision concerning Echo's request failed to consider Echo's properly and timely submitted technical showing.<sup>4</sup> Thus, reconsideration of Echo's pioneer's preference request is warranted. Echo therefore urges the Commission to reconsider the tentative denial of its request and grant Echo a pioneer's preference.

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<sup>2</sup> See Public Notice 22922 (April 30, 1992), (affording parties until June 1, 1992 to submit test results demonstrating the technical feasibility of their proposals).

<sup>3</sup> Letter from Thomas Stanley, OET Chief Engineer, to Jay L. Birnbaum (June 3, 1992) (denying confidentiality request but granting Echo two business days within which to refile any or all of the affected material).

<sup>4</sup> Echo's Progress Report was also referenced in several of Echo's pleadings filed in this proceeding.

**I. Echo Has Demonstrated That The Proposal It Has Developed Is Both Innovative and Feasible.**

Echo proposes an advanced two-way, terrestrial mobile data radio service ("MDRS") using ten 5 KHz channels based on a new digital Frequency Division, Time Division Multiple Access ("TDMA") compact mobile data radio that has already been tested. The materials that Echo filed with the Commission demonstrate that MDRS is technically feasible and innovative and will dramatically increase the capacity and efficiency of current data messaging services.

MDRS uses digital, low-cost user radios and miniature, low-cost base stations with a patented technology to transmit data in a high-speed, high-capacity manner. MDRS is, in fact, both more spectrum efficient and more cost efficient than other two-way data delivery systems currently offered or proposed. Significant increases in equipment capacity and sharp reductions in equipment cost will result in Echo's ability to offer a full-duplex (real time), two-way data messaging service at a fraction of the cost of other systems. For example, unlike conventional cellular equipment, MDRS user equipment is not frequency synthesized. All data processing, tuning, synchronization, error checking, and data flow management is combined in one custom gate array chip and a simple microprocessor (Model No. 8051), all with a combined cost of under \$10. Base station transmissions will include a high-stability

crystal for frequency reference. In contrast, user units will incorporate inexpensive crystals corrected by automatic frequency control (AFC) for frequency reference, all of which has been thoroughly and successfully tested in the field. These features combine to reduce the cost and increase the efficiency of MDRS equipment.<sup>5</sup>

Moreover, the MDRS technology has been developed so as to overcome potential co-channel interference problems. In particular, the spectrum efficiency of MDRS is enhanced by combining (1) narrow channels, (2) spectrum reuse, (3) elimination of the extra data transmission associated with less efficient protocols (commonly known as "overhead"), (4) data management that efficiently combines different classes of data, and (5) continuous one-bit "Status Requests" from the transmitter to handle "bursty" data.<sup>6</sup> Additionally, the test results contained in the appendices to Echo's Progress Report demonstrate that MDRS, as proposed in Echo's Petition for Rulemak-

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<sup>5</sup> See Progress Report, Section 3.6 and Figures 13, 14, 15; Consolidated Reply Comments of Echo Group L.P., at 4 (filed June 16, 1992) ("Consolidated Reply"); See also Echo's Consolidated Reply to Oppositions, at 3 (filed June 26, 1992).

<sup>6</sup> See Progress Report, at Section 3, Appendix II, at Section on "Modulation Spectrum in the Remote Packet Radio."

ing, will have essentially the same in-building penetration characteristics as cellular.<sup>7</sup>

The large volume of MDRS equipment that will be produced minimizes production costs even further. MDRS is patented and will be available to other service providers. In fact, several entities, including major providers of private and common carrier telecommunications services, have already indicated to Echo their interest in implementing MDRS for various mobile data applications. Moreover, Echo itself ultimately plans up to 600 base stations to serve six to nine million customers in the top 30 MSAs during its first phase of nationwide system development, with up to 1,800 base stations containing capacity to serve an added 12 to 18 million customers in "Phase II."<sup>8</sup> See Consolidated Reply at 7-8.

Echo has also demonstrated that the capital investment of one MDRS base station can be recovered in only two years with less than a \$0.002 charge per message delivered and with the base station operating at only one-quarter capacity.<sup>9</sup> These calculations account for peak and non-peak calling rates

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<sup>7</sup> See Progress Report, at Appendices I & II; Consolidated Reply, at 9-10.

<sup>8</sup> To further reduce costs, base station hardware consists of more than 80% OEM equipment supplied by manufacturers with larger market bases.

<sup>9</sup> See Progress Report at Sections 4.0-4.6.

and are conservative in that long messages are assumed to cost the same as short ones. Monthly access charges are also not included. Thus, MDRS will be a profitable service while cutting costs to consumers far below current levels. These reductions enable many new applications unattainable with today's high-priced two-way messaging services.

Basically, MDRS introduces five major improvements simultaneously to existing data delivery services:

1. Frequency Reuse: MDRS brings frequency reuse from paging and cellular to the data delivery industry. Spectrum shaping, "cell" splitting, and low base station cost allow for maximum frequency reuse in the MDRS technology.<sup>10</sup>

2. Base Station Synchronous Protocol: The MDRS base station transmits an error-checked, addressed packet to the user, commanding that the data be returned in a specified time slot. Automatic correction methods are used to eliminate errors. This fully synchronous, centrally controlled technique eliminates multiple layers of protocols and synchronized overhead common to other systems. Only the data bits actually

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<sup>10</sup> See Progress Report Section 3.2, Appendix I, at Figures 4-14 & Sections V-VII, Appendix II, at Section VI & Sections on "Interference Performance Report," "Propagation Expectations," "Modulation Spectrum in the Remote Packet Radio," and "TTI-DAC Phase I Field Trials."

needed for the radio transmission are sent through scarce spectrum. For short messages, the efficiency (data bits + [data bits + control bits]) is two to three times better than other message protocols.<sup>11</sup>

3. Single Bit Response for Bursty Data: Random origination of messages from user radios becomes unstable at a channel capacity of 15% or 30%, depending on whether variable message or time-slotted messages are used. The patented single-bit Status Request of the Echo system, however, increases throughput at least two times on typical bursty messages. Thus, on MDRS, even when channel-loading reaches 80-90%, virtually all messages sent will be successfully received.<sup>12</sup>

4. Base Station Beacon for AFC: The cost of the user radio is reduced by digitally locking its low cost crystal to the base station reference frequency. Other innovative radio design also reduces the cost of the user radios.<sup>13</sup>

5. OEM Base Station Design: The base station uses common, off-the-shelf subsystems to achieve low cost and high

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<sup>11</sup> See Progress Report Section 3.4 & Figures 3 and 4.

<sup>12</sup> See Progress Report at Section 3.3, Appendix II, at Section on "Modulation Spectrum in the Remote Packet Radio" at Figure 12.

<sup>13</sup> See Progress Report at Section 3.6.

reliability. In addition, it is miniaturized to minimize facility space and cost.<sup>14</sup>

II. Echo's Proposal More Than Satisfies the Criteria Identified in the Tentative Decision for Awarding Mtel a Pioneer's Preference.

Echo's MDRS proposal more than meets the criteria reiterated by the Commission in its Tentative Decision and applied favorably to the pioneer's preference request made by Mobile Telecommunications Technologies Corporation ("Mtel").<sup>15</sup> Based on these same criteria, the Commission should grant a pioneer's preference to Echo for the development of MDRS.

In tentatively granting Mtel a pioneer's preference for its nationwide wireless network service ("NWNS") proposal, the Commission found that Mtel had (1) developed and preliminarily demonstrated the feasibility of an innovative technology that significantly improves bit transmission rates, (2) submitted an innovative proposal providing new service functionalities for these improved bit rates, (3) and developed the technology to implement its proposal. Tentative Decision at ¶ 149.

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<sup>14</sup> See Progress Report at Section 3.5, Figures 7-12, Appendix II, at Section on "TTI-DAC Phase I Field Trials."

<sup>15</sup> Echo does not seek reconsideration of, or otherwise challenge, the pioneer's preference awarded to Mtel.

Similarly, as discussed above and in Echo's Progress Report and other filings in this proceedings, these same findings are warranted regarding Echo and its MDRS technology. Echo's development of MDRS uses a patented technology to enhance current two-way data messaging services, as evidenced by applying the factors the Commission has evaluated in reviewing preference requests. See Tentative Decision at ¶ 147. Echo's system incorporates at least five of these factors. For instance, MDRS will (1) provide "added functionality" to existing paging and two-way mobile data services;<sup>16</sup> (2) involve changed operating or technical characteristics, including a procedure that will enable the base station and mobile unit to transmit messages only during specified time slots and that will enable the mobile unit to "lock" into the frequency transmitted by the base station; (3) drastically "increase[] spectrum efficiency"; (4) increase the "speed [and] quality of information transfers" for duplex operations;<sup>17</sup> and (5) significantly "reduce[] cost to the public." Id.

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<sup>16</sup> See Progress Report, at Section 4.

<sup>17</sup> Echo has previously detailed the improvements in speed and quality of data transmission MDRS will offer over other two-way mobile data technologies. See Progress Report, at Sections 3.0-3.6; Consolidated Reply, at 12-15

MDRS also will provide for significant service innovations. For instance, although some of the technologies proposed in ET Docket 92-100, including Mtel's, would allow for some form of "acknowledgement" paging or other limited, simplex two-way operations, Echo's MDRS proposal consists of the only real-time, full-duplex service.<sup>18</sup> In contrast, Mtel's NWNS is a single channel, simplex, paging-like acknowledgement or "answer back" system. As such, Mtel's system will not provide "real-time" two-way services. Echo's fully duplexed system would in fact make MDRS such a real-time, two-way system.<sup>19</sup> In short, MDRS and NWNS employ different technologies designed to offer different services, and the awarding of a pioneer's preference for development of the two technologies is not mutually exclusive.

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<sup>18</sup> MDRS can economically and efficiently provide the fully duplexed two-way service it was designed for and at the same time accommodate traditional one-way paging and paging/acknowledgement services. See Progress Report at Section 3.6, Figure 6 & Section 4.0.

<sup>19</sup> Indeed, Mtel has conceded that its NWNS is not a substitute for more complex two-way data services that will support the needs of companies using proprietary hand-held, computer-based services to monitor and communicate with delivery, maintenance and sales personnel. See Mtel Petition for Rulemaking, RM-7978 at 9 & n.9.

MDRS has the flexibility to accommodate a wide range of services within the same base station channels. Thus, MDRS could be used for, among other things, delivery service verification, dispatch service, point-of-sale terminals, burglar alarm monitoring, acknowledgment paging service, electronic mail, emergency services, handicapped services, and facility monitoring all on one system.<sup>20</sup> Indeed, MDRS is so cost effective, easy to use, and convenient that consumers in the low and medium end markets will realistically be able to subscribe to and utilize services previously too expensive for them. Most important, however, Echo has also demonstrated that it has the technology to implement its proposal. MDRS has undergone extensive tests which demonstrate its technical feasibility.<sup>21</sup>

Finally, Echo has met the standard for a nationwide preference such as that granted to Mtel, presuming nationwide licenses for MDRS or a related service are ultimately issued. As Echo has demonstrated in its previous filings, MDRS has inherently nationwide applications.<sup>22</sup> Given the high-efficiency, low-cost aspect of MDRS and the economies of scale and variety of services that nationwide operations can bring,

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<sup>20</sup> See Progress Report, Section 4.

<sup>21</sup> See Progress Report, Appendices I & II.

<sup>22</sup> See Echo's Request for Pioneer's Preference, at 12-13 (July 30, 1991).

MDRS is most suitable to nationwide licensing. Indeed, limiting MDRS to only regional markets could impair its ability to serve users with nationwide businesses because of the potential for incompatible systems. Requiring such end users to obtain different end user equipment in each region where they do business will impede MDRS's ability to achieve the most efficient economies of scale. Further, a nationwide preference for Echo would be consistent with the Commission's underlying goal of promoting competition. See Tentative Decision at ¶ 151.

Conclusion

For the foregoing reasons, Echo respectfully requests that the Commission reconsider its Tentative Decision and grant Echo's Request for a Pioneer's Preference.

Respectfully submitted,

ECHO GROUP L.P.

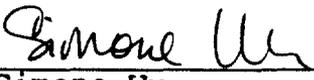
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Dated: September 14, 1992

CERTIFICATE OF SERVICE

I, Simone Wu, do hereby certify on this 14th day of September, 1992 that I have served a copy of the foregoing Petition for Reconsideration of Echo Group L.P. via first class mail, postage prepaid, or via hand delivery to the parties on the service list below.

  
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