

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

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MAR 11 1997

**FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY**

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In the Matter of)

Amendment of the Commission's Rules)
to Establish Part 27, the Wireless)
Communications Service ("WCS"))
)

GN Docket No. 96-228

PETITION FOR EXPEDITED RECONSIDERATION

PACS PROVIDERS FORUM

James F. Rogers
John G. Holland
of LATHAM & WATKINS
1001 Pennsylvania Avenue, N.W.
Suite 1300
Washington, D.C. 20004
(202) 637-2200

DIGIVOX CORPORATION

John Prawat
Chairman and Chief Executive Officer
Post Office Box 65094
Washington, D.C. 20035
(202) 293-1330

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I. INTRODUCTION

PACS Providers Forum ("PPF") and DigiVox Corporation ("DigiVox") hereby submit this petition for reconsideration of the Commission's Report and Order issued in the above-captioned proceeding (the "Order"). Specifically, PPF and DigiVox request that the Commission reconsider the out-of-band emission limits on the Wireless Communications Service ("WCS") contained in the Order because they impose unnecessary restrictions on the use of that spectrum, limit operational flexibility and thus are contrary to the public interest. As described in greater detail below, PPF and DigiVox propose that the Commission authorize the following out-of-band emission standards for subscriber units and base stations operating in either of the A or B bands of the WCS spectrum:

- subscriber unit transmit emission levels of $81 + 10 \log (P)$ dB
- base station transmit emission levels of $75 + 10 \log (P)$ dB

for technical operations that meet the following criteria:

- a 12.5% handset duty cycle with 312.5 msec pulse every 2.5 msec
- SU transmit power of 200 milliwatts
- RP transmit power of 800 milliwatts for RP at 25' height (for base stations mounted higher, it will be possible to raise the power in accordance with the additional path loss afforded by the greater distance)
- linear polarization
- only fixed (wireless local loop) and portable services may be provided (*i.e.*, no vehicle-mounted units are permitted).

II. TIMETABLE

This proceeding presents an extraordinary situation. Congress has mandated a timetable for the WCS auction that is very short. Further, the Order acknowledges that the out-of-band emission standards adopted by the Commission will “make mobile operations in the WCS spectrum technologically infeasible,”¹ a result which is clearly contrary to the public interest. The purpose of this Petition is therefore to demonstrate that the out-of-band emissions standards contained in the Order are not necessary to adequately protect satellite Digital Audio Radio Service (“SDARS”). If the Commission is unable to make a final determination on this issue, before the first payments are due for participation in the WCS auction, currently scheduled for Friday, April 4, anyone contemplating a mobile or portable use of that spectrum will be effectively precluded from participation in the auction.²

¹ See Order at ¶ 3.

² It is not enough that the Commission allow for the potential of a future waiver of the rules set out in the Order or provide mobile service providers the ability for strike deals with auction winners, as either possibility is far too risky and tenuous, and particularly so in light of the fact that any alternative use of the spectrum is of a vastly lesser value than mobile services.

Accordingly, PPF and DigiVox respectfully request that the Commission adopt the following expedited timetable for the resolution of this proceeding:³ (i) Oppositions to this Petition for Reconsideration should be filed by Friday, March 21; (ii) Reply Comments to any such Oppositions should be filed by Tuesday, March 25; and (iii) final resolution by the FCC of this issue should take place before Tuesday, April 1.⁴

III. BACKGROUND

PPF is an industry group established in 1995 to promote the development of Personal Access Communications Systems (“PACS”), a low-power, low-cost radio system capable of providing extremely high quality voice and data transmission for both fixed and mobile uses. PPF is a Washington, D.C., non-profit corporation, presently composed of ten member corporations,⁵ many of which are leaders in the development of PACS as an operating standard.⁶ By contrast, DigiVox Corporation was established in 1996 as a potential bidder in the

³ The Commission has the authority under 47 C.F.R. Section 1.3 to modify the time periods normally prescribed by 47 C.F.R. Section 1.429. To assist in expediting this timetable, PPF and DigiVox have served, by hand or overnight courier, copies of this Petition for Reconsideration to all parties of record. The Commission should require Oppositions to be served by hand or overnight courier as well.

⁴ April 1 is also the date on which the DARS auction is scheduled to commence. Commission guidance by that date may be helpful to bidders in that auction as well, although the effect of these rules is far less critical for DARS. Whatever technical rules are adopted will not change the fundamental nature of the DARS service as it will the WCS.

⁵ PPF’s members are: Bellcore; Brooktree Corporation; GCI Communications, Inc.; Hughes Network Systems; Lucent Technologies; Matsushita Communication Industrial Corporation of America/Panasonic; Motorola; National Paging and Personal Communications Association; NEC America, Inc.; Newbridge Networks; Pacific Communications Sciences, Inc. (“PCSI”); and Siemens Stromberg-Carlson.

⁶ PPF is not a standards-setting body, but has been organized to provide a forum for members to discuss developmental and technical issues.

WCS spectrum auction. Under its business plan, DigiVox proposes to implement PACS in markets secured by it in the upcoming WCS auction.

PACS itself is a low-tier, low-power system standardized for operation in the 1850-1990 MHz band licensed by the Commission for broadband Personal Communications Services ("PCS"). One of the distinguishing features of PACS is its small and inexpensive radio ports, or "cells," which make it an ideal technology for offering high-quality voice and data services in high traffic areas, utilizing as little as 10 MHz of spectrum. PACS is fully compatible with the local exchange network and is interoperable with existing cellular systems.

Because PACS is an emerging technology, its potential uses have not yet been fully defined, but it is certain that new wireless providers will be able to use PACS for fixed or mobile services, deployed either as stand-alone systems or as complements to high-tier, high-power Commercial Mobile Radio Service ("CMRS") systems such as cellular or PCS. With its small cells, PACS is particularly well-suited for fixed service uses, such as "wireless local loop," in-building wireless PBX ("private branch exchange" or "switchboard") and wireless centrex services. Given the Commission's recent order providing CMRS providers with maximum flexibility to use their spectrum to offer fixed and hybrid fixed/mobile services in addition to pure mobile service,⁷ PACS will facilitate the rapid deployment of PCS competitors as wireline local loop providers, providing economic and feature-rich services without sacrificing quality, reliability or security.

⁷ See Amendment of the Commission's Rules to Permit Flexible Service Offerings in the Commercial Mobile Radio Services, *First Report and Order and Further Notice of Proposed Rulemaking*, WT Docket No. 96-6 (released August 1, 1996).

IV. THE COMMISSION FAILED TO CONSIDER THE ENTIRE RECORD IN ADOPTING THE ORDER, AND THE LIMITS IT IMPOSED ARE NOT BASED ON SUBSTANTIAL EVIDENCE IN THE RECORD

When the Commission adopted its Order it failed to consider the entire record in this proceeding as required by Section 1.425 of the Commission's Rules.⁸ Specifically, the Commission neglected to address certain *ex parte* filings made on behalf of DigiVox that proposed out-of-band emission limits which, unlike the out-of-band emission limits set forth in the Order, would allow for flexible use of the WCS spectrum and at the same time provide reasonable protection against interference to operations in adjacent spectrum bands.⁹ The Commission failed to address these filings in its Report and Order despite the fact that the findings made therein are unrefuted. Comments filed by Primosphere Limited Partnership ("Primosphere") as well as its various *ex parte* filings fail to refute those findings, and consequently do not support or substantiate the Commission's conclusions regarding out-of-band emission limits. Further, there is not any other documentation in the record that sufficiently refutes the showings of DigiVox's filings. As a result, the conclusions reached by the Commission and the limits it ultimately adopted in the Order are not based on substantial evidence in the record.

⁸ 47 C.F.R. Section 1.425.

⁹ *See Ex Parte* Letter from John Prawat, President and CEO of DigiVox, to William F. Caton, Acting Secretary of the Federal Communications Commission (February 5, 1997); *Ex Parte* Letters of February 5 and January 28, 1997.

For these reasons the Commission should reconsider the out-of-band emission limits that were adopted in the Order.¹⁰ The Commission should adopt instead either the out-of-band emission limits that it initially determined to be acceptable and which it proposed in its Notice of Proposed Rulemaking,¹¹ *In the Matter of Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service ("WCS")*, Notice of Proposed Rulemaking, GN Docket No. 96-228 (released November 12, 1996), or the limits proposed by Hughes Network Systems ("HNS") and Bellcore in Exhibits A and B hereto, respectively.

These *ex parte* filings clearly demonstrated that the out-of-band emission limits adopted by the Commission are unnecessarily restrictive and that less stringent limits would adequately protect services in adjacent bands from interference. In these filings, DigiVox and HNS showed that the less restrictive limits they proposed are highly unlikely to cause interference to other services, including the SDARS services that are expected to operate at 2320-2345 Mhz. HNS and DigiVox have shown that, with the five megahertz guard bands that the Commission adopted to insulate the SDARS 2320-2345 MHz band, WCS services would produce even less interference than that band already suffers as a result of general background noise and noise from other sources, including microwave ovens, UHF television stations

¹⁰ The Report and Order adopted the out-of-band emission limits of $80 + 10 \log (P)$ dB on all frequencies between 2320 and 2345 MHz for fixed operations and $110 + 10 \log (P)$ dB on all frequencies between 2320 and 2345 MHz for mobile operations.

¹¹ In its Notice of Proposed Rulemaking, the Commission determined that out-of-band emission limits of $70 + 10 \log (P)$ dB on all frequencies between 2320 and 2345 MHz for fixed operations and $43 + 10 \log (P)$ dB on all frequencies between 2320 and 2345 MHz for mobile operations would be sufficient to protect services in the 2320-2345 MHz band.

operating on channels 64 and 65 and land mobile stations operating in the 450 MHz band. These findings have not been refuted.

Primosphere attempted to discredit the premises that support DigiVox's finding through a series of *ex parte* filings. However, the letter provided as Attachment 1 to DigiVox's February 5, 1997 *ex parte* filing refutes the propositions that Primosphere set forth in its attempt to support overly stringent emission standards.¹² Primosphere has not countered these assertions.

For example:

- (i) Contrary to Primosphere's original assertions, the likelihood of a Primosphere receiver being very close to either a handset from two different WCS providers or two base stations at the same time is so unlikely that it should be discounted for purposes of calculating the appropriate level of increase in receiver noise floor. The correction of this fact alone allows for an increase in the receiver noise floor of 2 dB without increasing the likelihood of interference.
- (ii) Contrary to Primosphere's original calculations, HNS has demonstrated that frequency roll-off is irrelevant to emission limitation analysis as the HNS findings account for the cumulative amount of energy that will exist in the DARS band. As a result of this flawed premise, Primosphere overstated the need for out-of-band emission protection.
- (iii) Primosphere, in its submission, overlooks the impact of the duty cycle of WCS interference on operations in the DARS band and continues to withhold information that is uniquely available to Primosphere. In the absence of this material information in the record of this proceeding, the Commission has an inadequate basis on which to credit Primosphere's arguments and therefore must accept HNS's analysis of the out-of-band emission standards.

The unsubstantiated conclusions reached in the Commission's Order result in limits that are too restrictive to allow PACS service to exist and to provide competition in the

¹² See Letter from Stan Kay, Assistant Vice President of HNS to John Prawat, dated February 5, 1997.

local telecommunications marketplace. In addition to unnecessarily precluding mobile applications in the WCS spectrum, the limits adopted by the Commission would also require major alterations to equipment of entities hoping to provide service using the WCS spectrum, as DigiVox noted in its Reply Comments in this proceeding.¹³ For example, the adopted limits will require providers of low-tier PACS services on the WCS spectrum to totally redesign their base stations from the ground up in ways that would increase the costs of providing PACS service on the spectrum to the public. For low-tier services such as PACS, any cost increase is critical because such technologies are based on the distribution of thousands of base stations throughout a metropolitan area. In addition, the limits that were adopted will preclude portable PACS handsets. For example, to meet the technical specifications required by the adopted limits, each “handset” unit would have to be the size of a briefcase and would be prohibitively expensive.

Based on the foregoing paragraphs it is clear that in adopting the out-of-band emission standards set out in the Order the Commission failed to consider the entire record as required by Section 1.425 of the Commission’s Rules, resulting in technical standards that are unduly stringent and clearly not in the public interest.

V. **ADEQUATE PROTECTION OF SDARS CAN BE ACHIEVED WITHOUT PRECLUDING PORTABLE SERVICE IN THE ADJACENT WCS BANDS.**

Even if the Commission determines that SDARS must be protected against the potential for interference from operations in the WCS bands, it is possible to protect SDARS from the potential of such out-of-band emissions without precluding the use of portable services

¹³ See Reply Comments of DigiVox.

such as PACS in these bands. Engineers from HNS and Bellcore have each concluded that portable PACS can co-exist with SDARS in the WCS bands without consequential interference between the systems if certain emission limits and operational parameters are observed. Specifically, by adopting the technical parameters set out in Exhibits A and B hereto, the Commission can afford WCS operators the flexibility to use WCS spectrum for portable services such as PACS, while providing SDARS more than more than sufficient protections from the very remote probability of interference arising through close operational contact between the two systems.

In brief, those parameters would limit out-of-band emissions for subscriber units and base stations operating in either of the A or B bands of the WCS spectrum to the following:

- subscriber unit transmit emission levels of $81 + 10 \log (P)$ dB
- base station transmit emission levels of $75 + 10 \log (P)$ dB

for technical operations that meet the following criteria:

- a 12.5% handset duty cycle with 312.5 msec pulse every 2.5 msec
- SU transmit power of 200 milliwatts
- RP transmit power of 800 milliwatts for RP at 25' height (for base stations mounted higher, it will be possible to raise the power in accordance with the additional path loss afforded by the greater distance)
- linear polarization
- only fixed (wireless local loop) and portable services may be provided (*i.e.*, no vehicle-mounted units are permitted).

In addition, the frequency band plan must provide for subscriber unit transmissions in the 2305-2310 MHz (A Band) and 2310-2315 MHz (B Band) range, with reception in the 2350-2355 MHz (A Band) and 2355-2360 MHz (B Band) portion of the range.¹⁴

Unlike the limits adopted in the Order, the solution offered by PPF and DigiVox would facilitate the flexibility of usage that the Commission intended when it allocated the 2305-2320 and 2345-2360 MHz bands for use by WCS operators for a variety of “fixed, *mobile*, SDARS and radio location services.”¹⁵ To the contrary, the limits adopted in the Report and Order unnecessarily restrict usage of the 2305-2320 and 2345-2360 MHz bands despite the Commission’s stated desire to use that spectrum to provide the “broadest range of services permitted under international agreements.”¹⁶ By the Commission’s own admission, the limits that it adopted would make mobile applications in the WCS spectrum technologically infeasible. The elimination of such mobile applications for WCS could effectively preclude the use of that spectrum for many technologies, especially low power microcellular technologies such as PACS, that uniquely promise to provide real competition to the local loop.

The overprotective limits adopted by the Commission will unnecessarily deny the public the benefits of real competition to local exchange carriers that low-tier services are uniquely capable of providing. As a result, the Commission should reconsider the out-of-band emission limits that appeared in the Report and Order and, after considering the unrefuted

¹⁴ As set forth in Exhibit A, the transmit allocations must be at the lower end of both A and B Bands (and not reversed, as the Commission had recommended); otherwise, there will be significant cost and interference concerns.

¹⁵ See *Notice* at ¶ 6 (emphasis added).

¹⁶ *Id.*

findings in DigiVox's *ex parte* filings, adopt the least restrictive solution that is necessary to protect SDARS and other services from interference from WCS operations and the only solution that is substantiated by the record in this proceeding. PPF and DigiVox have proposed a solution, which, as the Commission will see after carefully reviewing the entire record, optimally maximizes flexibility of use for WCS spectrum, avoids unreasonable interference to services in adjacent spectrum bands, and facilitates the provision of services that are uniquely equipped to bring real competition to the local loop.

VI. GIVEN THE EXTREMELY LOW PROBABILITY OF INTERFERENCE BETWEEN DARS AND PACS, THE EXTRAORDINARY INTERFERENCE PROTECTION AFFORDED DARS IN THE ORDER IS UNNECESSARY

Under the $80 + 10 \log (P)$ dB and $75 + 10 \log (P)$ dB out-of-band emission limits proposed by PPF and DigiVox for both fixed and mobile operations on all frequencies between 2320 and 2345 MHz, the likelihood of a mobile WCS unit coming into interference range with an SDARS receiver is remote at worst and inconceivably small at best. Under the proposed limits, an operating WCS handset would have to come within twelve feet of an operating SDARS antenna for there even arguably to be any interference between the two systems. As set forth in Attachment D hereto, given the real world practicalities of the operations of the two systems, it is highly improbable that the two systems will come into such close contact with each other.¹⁷

While still infinitesimal, the probability of such contract is greatest in congested urban settings, particularly in urban areas located in the Eastern United States, where both

¹⁷ See Exhibit C.

automobile and pedestrian traffic are dense. Such congested urban areas are one of the few settings in which there is any possibility of users of WCS services coming within twelve feet of an individual using SDARS. Even in such a case, the interfering contact would on average last no more than one second for every 200 minutes of listening.

WCS handsets and SDARS antennas are even less likely to come within a twelve-foot proximity of each other at the center of newer cities in the Western United States, where automobile and pedestrian traffic are less concentrated than in Eastern cities. In those areas, the two systems will come into twelve feet of each other only once every 195,000 miles in the best case and once every 325 miles in the worst case. In the more likely scenario, however, drivers listening to SDARS are unlikely to come within twelve feet of a WCS handset any more than two to three times in a given year. These two or three potential encounters would each last only one second for every 4,000 hours of driving.

Finally, SDARS operations are least likely to come within twelve feet of contact with WCS handsets in traffic on urban expressways. In the best case, a driver on an urban expressway listening to SDARS will approach within twelve feet of a WCS handset only once every 250,000 miles. Further, for every second of such a WCS encounter, the SDARS listener will enjoy nearly 12 million seconds of uninterrupted service. Even in the worst case, the likelihood of close contact remains remote. In such situations, a commuter who listens to SDARS will come within twelve feet of a WCS handset only once every 375 miles for a total of less than one second out of an entire week. While these are the extreme situations, the average commuter listening to SDARS realistically will not be likely to be within twelve feet of a handset for more than three seconds of an entire year.

The calculations of the likelihood of 12 foot WCS/SDARS encounters in various settings are based upon the conclusion that a separation of twelve feet is necessary to preclude interference between WCS handset carriers and SDARS listeners. However, even if it were found that 15 feet of separation were necessary to prevent interference between WCS and SDARS users, the likelihood of interference-causing encounters would remain remote. For example, in the urban areas of the Eastern United States, where interaction between WCS handsets and SDARS antennas is most likely, in the worst case, a driver listening to a SDARS service is only likely to come within 15 feet of a WCS handset once every 16 miles, with over 5,300 seconds of clear reception for each second of WCS interference. Even here, the potential for interference is overstated because the SDARS systems will need repeaters to overcome other sources of interference found in urban areas. These same repeaters will also eliminate interference from WCS use. The most dramatic increase in the number of interference-causing contacts would occur on the expressway, where the number of seconds between interferences would be cut in half to one second out of every 9,376, still more than enough protection for SDARS service.

In sum, under the out-of-band emission limits proposed by PPF, DigiVox HNS and Bellcore, there would be only a strikingly remote possibility of SDARS operations coming into interference range with WCS operations, even under circumstances that are most unfavorable to WCS providers.

VII. **THE COMMISSION SHOULD ALLOW FOR THE USE OF WCS SPECTRUM IN A MANNER THAT ACCOMMODATES THE OPERATIONS OF A VARIETY OF WCS PROVIDERS, INCLUDING PORTABLE WIRELESS SERVICES**

In the Omnibus Consolidated Appropriations Act of 1997,¹⁸ Congress required the Commission to reallocate the frequencies at 2305-2320 and 2345-2360 MHz for wireless services that are consistent with international agreements concerning spectrum allocations, and to assign the use of this spectrum via competitive bidding procedures.¹⁹ In response to Congress's action, the Commission has decided to take the innovative step of creating a new service, WCS, that would permit spectrum obtained by a potential WCS licensee to be used flexibly, depending on the nature and business vision of the individual provider. As the Commission's actions in this proceeding have confirmed, permitting a potentially broad range of fixed, mobile, radio location and broadcasting satellite services to make use of WCS spectrum is in the public interest.

PPF and DigiVox strongly support the Commission's implementation of policies that promote spectrum flexibility and market-based determinations as to the best "mix" of WCS services desired by the public. It is critical, however, that this service mix should include low-cost wireless local loop services and innovative complements to emerging PCS systems. PACS and related systems promise to offer fixed or portable services, deployed either as stand-alone systems or as complements to high-tier, high-power CMRS systems, in-building wireless PBX and wireless centrex services. Through these services, PACS will facilitate the rapid deployment of PCS competitors to wireline local loop providers, providing economic and feature-rich

¹⁸ See Omnibus Consolidated Appropriations Act, 1997, P.L. 104-208, 110 Stat. 3009 (1996) ("Appropriations Act").

¹⁹ See Notice at ¶ 2.

services without sacrificing quality, reliability or security. These services will provide consumers with new choices and create new opportunities for emerging businesses operating in the WCS bands.²⁰

It is critical to emphasize that these new businesses would not be redundant to the services offered by PCS providers today. As noted above, the anticipated WCS offerings would be complementary to current fixed and mobile services, and would effectively expand the universe of potential uses and users rather than adding an unnecessary, additional competitor into a highly competitive field. Speaking to this issue, the Commission has made clear that “CMRS licensees have no reasonable basis to expect that [the Commission] would limit the possibility of further entry by withholding spectrum or by unnecessarily restricting the permissible uses of newly allocated spectrum.”²¹

As noted above, however, the out-of-band emissions limits adopted by the Commission in the Order “will, at least for the foreseeable future, make mobile operations in the WCS spectrum technologically infeasible.”²² PPF and DigiVox therefore urge the Commission

²⁰ The argument cannot credibly be made that sufficient capacity exists through related mobile services, thus rendering potential portable use of the WCS band unnecessary. As noted above, the anticipated WCS offerings would be complementary to current mobile services, and would effectively expand the universe of potential uses and users rather than adding an unnecessary, additional competitor into a highly competitive field. Speaking to this issue, the Commission has made clear that “CMRS licensees have no reasonable basis to expect that [the Commission] would limit the possibility of further entry [into related operations] by withholding spectrum or by unnecessarily restricting the permissible uses of newly allocated spectrum.” *Order* at ¶ 34. The implementation of the out-of-band emission standards set out in the Order, however, would have that exact restrictive effect. *See id* at ¶ 3.

²¹ *Order* at ¶ 34.

²² *Order* at ¶ 3.

to adopt the out-of-band emission standards identified above and detailed in Exhibits A and B hereto, and by so doing, ensure that the spectrum allocated to WCS will support the commercial development of new and complementary PCS offerings, significantly advancing the public interest.

VIII. **CONCLUSION**

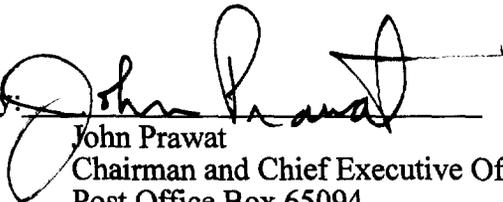
PPF and DigiVox respectfully request that the Commission reconsider the out-of-band emission limits contained in the Order and adopt the out-of-band emission standards for operations in the WCS bands as provided in Exhibits A and B hereto no later than April 1, 1997.

Respectfully submitted,

PACS PROVIDERS FORUM

By: 
James F. Rogers
John G. Holland
of LATHAM & WATKINS
1001 Pennsylvania Avenue, N.W.
Suite 1300
Washington, D.C. 20004

DIGIVOX CORPORATION

By: 
John Prawat
Chairman and Chief Executive Officer
Post Office Box 65094
Washington, D.C. 20035
(202) 293-1330

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To: The Commission

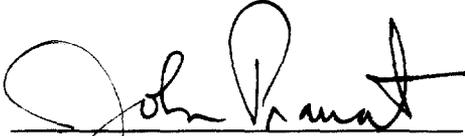
DECLARATION UNDER OATH

I, John Prawat, hereby declare under oath as follows:

1. I am President and CEO of DigiVox Corporation; and
2. I have reviewed the foregoing Petition for Expedited Reconsideration, and the facts set forth therein, except those of which official notice may be taken, are true and correct to the best of my knowledge, information and belief.

I hereby declare under penalty that the foregoing is true and correct.

Respectfully submitted,



John Prawat

March 11, 1997

CERTIFICATE OF SERVICE

I, Wanda J. Sisco, hereby certify that a copy of the foregoing Petition for Expedited Reconsideration of DigiVox Corporation and the PACS Providers Forum was sent this 11th day of March, 1997, via hand delivery or overnight courier, to the following:

Neff David J.
Vice President, Marketing
ITS Corporation
375 Valley Brook Road
McMurray, PA 15317-3345*

Kathleen Q. Abernathy, Esq.
David A. Gross, Esq.
1818 N. Street, N.W., Suite 800
Washington, D.C. 20036

Glenn S. Rabin, Esq.
ALLTEL Corporate Services, Inc.
655 15th Street, N.W., Suite 220
Washington, D.C. 20005

Lon C. Levin
Vice President
American Mobile Radio Corporation
10802 Parkridge Boulevard
Reston, VA 22091

Christopher D. Imlay, General Counsel
American Radio Relay League, Inc.
Booth Freret Imlay & Tepper, PC
1233 20th Street, N.W.
Suite 204
Washington, D.C. 20036-2304

Thomas J. Keller, Esq.
Verner Liipfert Bernhard McPherson
& Hand, Chartered
901 15th Street, N.W., Suite 700
Washington, D.C. 20005

William K. Keane, Esq.
Arter & Hadden
1801 K Street, N.W.
Suite 400K
Washington, D.C. 20006

Robert J. Miller, Esq.
Gardere & Wynne, LLP
1601 Elm Street, Suite 3000
Dallas, TX 75201*

Lynn R. Charytan
Wilmer, Cutler & Pickering
2445 M Street, N.W.
Washington, D.C. 20037

Wayne V. Black, Esq.
Paula Deza, Esq.
Keller & Heckman, LLP
1001 G Street, N.W., Suite 500 West
Washington, D.C. 20005

John H. Sullivan
Deputy Executive Director
American Water Works Association
Government Affairs Office
1401 New York Avenue, N.W., Ste. 640
Washington, D.C. 20005

Robert M. Gurss, Esq.
Wilkes Artis Hedrick & Lane, Chartered
1666 K Street, N.W.
Suite 1100
Washington, D.C. 20006

* Denotes delivery via overnight courier.

Cathleen A. Massey
Douglas I. Brandon
AT&T Wireless Services, Inc.
1150 Connecticut Avenue, N.W.
Suite 400
Washington, D.C. 20036

John T. Scott, III, Esq.
Crowell & Moring LLP
1001 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

William B. Barfield, Esq.
Jim O. Llewellyn, Esq.
BellSouth Corporation
1155 Peachtree Street, N.E., Suite 1800
Atlanta, GA 30309-2641*

Michael F. Altschul, Vice President
Randall S. Coleman, Vice President
Cellular Telecommunications Industry
Association
1250 Connecticut Avenue, Ste., 200
Washington, D.C. 20036

George Hanover, Vice President
Joe Peck, Acting Director
Consumer Electronics Mfrs. Assn.
2500 Wilson Boulevard
Arlington, VA 22201

Steve C. Hillard
Cook Inlet Communications, Inc.
1966 13th Street
Suite 280
Boulder, CO 80302*

Mark J. Golden
Personal Communications Industry Assoc.
500 Montgomery Street
Suite 700
Alexandria, VA 22314-1561

Howard J. Symons, Esq.
Sara F. Seidman, Esq.
Gregory R. Firehock, Esq.
Mintz Levin Cohn Ferris Glovsky and Popeo
701 Pennsylvania Avenue, N.W., Suite 900
Washington, D.C. 20004

Louise L. M. Tucker, Esq.
Bell Communications Research, Inc.
2101 L Street, N.W., Suite 600
Washington, D.C. 20037

David G. Frolio, Esq.
David G. Richards, Esq.
BellSouth Corporation
1133 21st Street, N.W.
Washington, D.C. 20036

John Windhauser, Jr.
General Counsel
Competition Policy Institute
1156 15th Street, N.W.
Suite 310
Washington, D.C. 20005

David Alan Nall, Esq.
Squire Sanders & Dempsey
1201 Pennsylvania Avenue, N.W.
Post Office Box 407
Washington, D.C. 20004

Diane S. Hinson, Esq.
Cheryl A. Tritt, Esq.
Morrison & Foerster LLP
2000 Pennsylvania Avenue, N.W., Suite 5500
Washington, D.C. 20006-1888

Randall B. Lowe, Esq.
Laura S. Roecklein, Esq.
Piper & Marbury LLP
1200 19th Street, N.W.
Washington, D.C. 20036

David L. Hill, Esq.
Audrey P. Rasmussen, Esq.
O'Connor & Hannan, LLP
1919 Pennsylvania Avenue, N.W., Suite 800
Washington, D.C. 20006-3483

Veronica M. Ahern, Esq.
J. Breck Blalock, Esq.
Nixon Hargrave Devans & Doyle
One Thomas Circle
Washington, D.C. 20005

Edwin N. Lavergne, Esq.
J. Thomas Nolan, Esq.
Ginsburg Feldman & Bress
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036

Henry Geller, Esq.
1750 K Street, N.W.
Suite 800
Washington, D.C. 20006

David J. McClure
President
Multipoint Networks
19 David Drive
Belmont, CA 94002-3001*

Mark J. Tauber, Esq.
Mark J. O'Connor, Esq.
Piper & Marbury, LLP
1200 19th Street, N.W.,
7th Floor
Washington, D.C. 20036

Margaret F. Garber, Esq.
Pacific Telesis Group
1275 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

Audrey J. Lachance, Esq.
GTE Service Corporation
1850 M Street, N.W.
Suite 1200
Washington, D.C. 20036

Mark E. Crosby, President
Frederick J. Day, Esq.
Industrial Telecommunications Association
1110 N. Gleber Road, Suite 500
Arlington, VA 22201

Theodore M. Weitz, Esq.
Stephen Rosen, Esq.
Lucent Technologies, Inc.
283 King George Road, Room C2A23
Warren, N.J. 07059*

Richard Barth, Director
Stuart Overby, Director
Motorola
1350 Eye Street, N.W., Suite 400
Washington, D.C. 20005

Henry L. Baumann, Executive VP
Valerie Schulte, Esq.
National Association of Broadcasters
1771 N Street, N.W.
Washington, D.C. 20036

James P. Tuthill, Esq.
Betsy S. Granger, Esq.
Lucille M. Mates, Esq.
Pacific Telesis Group
140 New Montgomery Street, Room 1526
San Francisco, CA 94105*

James H. Barker, Esq.
Steven H. Schulman, Esq.
Latham & Watkins
1001 Pennsylvania Avenue., N.W., Ste, 1300
Washington, D.C. 20004

R. Michael Senkowski, Esq.
Katherine M. Holden, Esq.
Stephen J. Rosen, Esq.
Wiley Rein & Fielding
1776 K Street, N.W.
Washington, D.C. 20006

Leslie A. Taylor
Guy T. Christiansen
Leslie Taylor Associates
6800 Carlynn Court
Bethesda, MD 20817-4302

David A. Reams, Esq.
Law Office of David A. Reams
P.O. Box 502
Perrysburg, OH 43552*

Clayton Mowry, Director
Lon Levin, Esq.
Satellite Industry Association
225 Reinkers Land
Suite 600
Alexandria, VA 22314

Carol Tacker, Esq.
Bruce Beard, Esq.
Southwestern Bell Mobile Systems
17330 Preston Road, Suite 100A
Dallas, TX 75252*

Jonathan M. Chambers, Esq.
Sprint Spectrum, LP
1801 K Street, N.W. Suite M-112
Washington, D.C. 20006

James A. Casey, Esq.
Morrison & Foerster LLP
2000 Pennsylvania Avenue, N.W., Ste. 5500
Washington, D.C. 20006

George Y. Wheeler, Esq.
Koteen & Naftalin LLP
1150 Connecticut Avenue, N.W.
Washington, D.C. 20036

Mark J. Golden, Senior VP
Personal Communications Industry Assoc.
500 Montgomery Street
Suite. 700
Alexandria, Virginia 22314-1561

Tina M. Pidgeon, Esq.
Drinker Biddle & Reath
901 15th Street, N.W.
Suite 900
Washington, D.C. 20005

Caressa D. Bennet, Esq.
Gregory W. Whiteaker, Esq.
Bennet & Bennet, PLLC
1019 Nineteenth Street, N.W., Suite 500
Washington, D.C. 20009

James D. Ellis, Esq.
Robert M. Lynch, Esq.
David F. Brown, Esq.
SBC Communications, Inc.
175 E. Houston, Room, 1254
San Antonio, TX 78205*

Duward D. Dupre, Esq.
Mary W. Marks, Esq.
Southwestern Bell Telephone Company
One Bell Center, Room 3558
St. Louis, MO 63101*

Jay C. Keithley, Esq.
Sprint Corporation
1850 M Street, N.W., Suite 1100
Washington, D.C. 20036

Dr. Eric Schmidt
Sun Microsystems Laboratories
2550 Garcia Avenue
Mountain View, CA 94043-1100*

Jeffrey L. Sheldon, General Counsel
Sean A. Stokes, Assoc. General Counsel
UTC
1140 Connecticut Avenue, N.W., Ste. 1140
Washington, D.C. 20036

Robert A. Hart IV, Chairman
21st Century Telesis, Inc.
P.O. Box 66436
Baton Rouge, LA 70896*

Paul C. Besozzi, Esq.
Janet Fitzpatrick, Esq.
Patton Boggs, LLP
2550 M Street, N.W.
Washington, D.C. 20037

Leonard R. Raish
Fletcher, Heald & Hildreth, P.L.C.
11th Floor
1300 North 17th Street
Rosslyn, VA 22209

John T. Scott, III
Crowell & Moring, LLP
1001 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

Stuart Overby, Asst. Dir., Spectrum Planning
Motorola
1350 Eye Street, N.W.
Washington, D.C. 20005

Diane S. Hinson
Morrison & Forester LLP
2000 Pennsylvania Avenue, N.W.
Suite 5500
Washington, D.C. 20006

Kathleen Q. Abernathy
AirTouch Communications, Inc.
1818 N Street, N.W.
Suite 800
Washington, D.C. 20036

William L. Roughton, Jr.
Associate General Counsel
PrimeCo Personal Communications, L.P.
1133 20th Street, N.W., Suite 850
Washington, D.C. 20036

Joe B. Wyatt, Chancellor
Vanderbilt University
211 Kirkland Hall
Nashville, TN 37240*

International Transcription Service
1919 M Street, N.W.
Room 146
Washington, D.C. 20036

Cathleen A. Massey
Vice President - External Affairs
AT&T Wireless Services, Inc.
1150 Connecticut Avenue, N.W., Suite 400
Washington, D.C. 20036

Mark J. O'Connor
Piper & Marbury, L.L.P.
1200 19th Street, N.W., Seventh Floor
Washington, D.C. 20036

Henry Geller
1750 K Street, N.W.
Suite 800
Washington, D.C. 20006

David J. McClure
President and CEO
Multipoint Networks, Inc.
19 Davis Drive
Belmont, CA 94002-3001*

George Hanover
Vice President, Engineering
Consumer Electronics Manufacturers Assoc.
2500 Wilson Boulevard
Arlington, VA 22201

Mark E. Crosby
President and CEO
Industrial Telecommunications Assoc., Inc.
1110 N. Glebe Road, Suite 500
Arlington, VA 22201

Steve C. Hillard
Cook Intel Region, Inc.
1966 13th Street, Suite 280
Boulder, CO 80302*

Henry L. Baumann
National Association of Broadcasters
1771 N Street, N.W.
Washington, D.C. 20036

Ronald J. Binz
Competition Policy Institute
1156 15th Street, N.W.
Suite 310
Washington, D.C. 20005

James H. Barker
Latham & Watkins
1001 Pennsylvania Avenue, N.W., Ste. 1300
Washington D.C. 20004

John H. Sullivan
Deputy Executive Director
American Water Works Association
Government Affairs Office
1401 New York Avenue, N.W., Suite 640
Washington, D.C. 20005

ITS
2100 M Street, N.W.
Suite 140
Washington, D.C. 20037

Dennis Couillard
Wayne Leland
Eric Schimmel
TIA
2300 Wilson Blvd., #300
Arlington, VA 22201

William B. Barfield
Jim O. Llewellyn
BellSouth Corporation
1155 Peachtree St., NE, Ste. 1800
Atlanta, GA 30309-2641*

Lynn R. Charytan
Wilmer, Cutler & Pickering
2445 M Street, N.W.
Washington, D.C. 20037

Louise L.M. Tucker
2101 L Street, N.W., Suite 600
Washington, D.C. 20037

Jeffrey L. Sheldon
General Counsel
UTC, The Telecommunications Assoc.
1140 Connecticut Avenue, N.W., Ste. 1141
Washington, D.C. 20036

George Y. Wheeler
Koteen & Naftalin, L.L.P.
1150 Connecticut Avenue, N.W., Ste. 1000
Washington, D.C. 20036

Wayne V. Black
Brian Turner Ashby
Keller & Heckman LLP
1001 G Street, N.W.
Suite 500 West
Washington, D.C. 20001

Cheryl A. Tritt
Morrison & Forester, LLP
2000 Pennsylvania Ave., N.W., Ste. 5500
Washington, D.C. 20006

Leslie A. Taylor
Guy T. Christiansen
Primosphere Limited Partnership
6800 Carlynn Court
Bethesda, MD 20817-4302

Laura S. Roecklein
Piper & Marbury, L.L.P.
1200 19th St., N.W.
Washington, D.C. 20036