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April 8, 1992

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Federal Communications Commission
Office of the Secretary

ORIGINAL FILE

Ms. Donna Searcy
Secretary
Federal Communications Commission
Room 222
1919 M Street, N.W.
Washington, D.C. 20554

Re: Request of Loral Qualcomm Satellite Services, Inc. for a Pioneer's Preference, ET Docket No. 92-28, PP-31

Dear Ms. Searcy:

Attached are an original and the required copies of the Comments of Loral Qualcomm Satellite Services, Inc. in the above-captioned matter.

Please contact the undersigned should you have any questions.

Sincerely yours,

Leslie A. Taylor

Leslie A. Taylor

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

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Federal Communications Commission
Office of the Secretary

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| In the Matter of: | ) | |
| LORAL QUALCOMM SATELLITE | ) | Docket No. ET 92-28 |
| SERVICES, INC. | ) | File No. PP-31 |
| | ) | |
| Request for a Pioneer's | ) | |
| Preference with regard to | ) | |
| Its Application for Authority | ) | |
| To Construct GLOBALSTAR, a | ) | |
| Low-Earth Orbit Satellite | ) | |
| Communications System | ) | |

# COMMENTS IN SUPPORT OF REQUEST FOR PIONEER'S PREFERENCE

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April 8, 1992

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## SUMMARY

The Commission should grant a pioneer's preference to Loral Qualcomm Satellite Services, Inc. (LQSS) for the key CDMA technology that Qualcomm, Inc., LQSS shareholder, has developed and continues to develop for use in the provision of mobile voice, data and RDSS service from a low-earth orbit satellite system.

The LQSS proposal qualifies for a pioneer's preference because it will lead to the establishment of a communications service not currently provided; involves substantial innovation; will promote the efficient use of the spectrum as well operate compatibly with other systems; and through the unique system architecture of GLOBALSTAR, will enable the extension of the existing terrestrial telecommunications infrastructure in a cost-effective manner. LQSS has demonstrated, in its application, request for pioneer's preference, petition for rulemaking and record developed thus far, the technical feasibility of its proposal.

LQSS shareholder Qualcomm, Inc. has developed proprietary, integrated software and hardware for digitally transmitting telecommunication signals using CDMA. The Qualcomm CDMA technology permits vastly increased capacity (up to 10 to 20 times over the current FDMA analog terrestrial cellular systems) and high quality through more error correction, less susceptibility to fading and soft call hand-off. These enhanced capabilities for mobile systems will be incorporated, along with additional innovations, into the GLOBALSTAR system.

The Commission must consider the rationale for creating the pioneer's preference, e.g., encouragement of new spectrally efficient technologies which can bring better and more economical telecommunications service to the public, as well as its policies of open entry and competition, in granting a pioneer's preference in this proceeding. In addition, the Commission must consider the outcome of the 1992 World Administrative Radio Conference, which allocated the RDSS spectrum for mobile-satellite service, for use by multiple systems. Thus a grant of a pioneer's preference to LQSS will recognize innovation and fulfill important Commission policies and the public interest.

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

| | | |
|---|---|---|
| In the Matter of:<br>LORAL QUALCOMM SATELLITE SERVICES, INC.<br><br>Request for a Pioneer's Preference with regard to Its Application for Authority To Construct GLOBALSTAR, a Low-Earth Orbit Satellite Communications System | )<br>)<br>)<br>)<br>)<br>)<br>)<br>)<br>) | Docket No. ET 92-28<br>File No. PP-31 |

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Federal Communications Commission
Office of the Secretary

COMMENTS IN SUPPORT OF REQUEST FOR PIONEER'S PREFERENCE

Loral Qualcomm Satellite Services, Inc. (LQSS), by its attorneys, hereby submits comments in support of the Request of LQSS for a Pioneer's Preference with regard to LQSS' proposed GLOBALSTAR low-earth orbit satellite communications system.

LQSS submits that its application for authority to construct GLOBALSTAR, File No. 19-DSS-P-91(48) and CSS-91-014, the record with regard to that application, the Request for Pioneer's Preference, File No. PP-31, the LQSS petition for rulemaking filed November 4, 1991, the results of the 1992 World Administrative Radio Conference,[1] and the Commission's long-standing policies promoting efficient use of the spectrum and multiple entry, support grant of a Pioneer's Preference to LQSS.

[1] See, Addendum and Corrigendum and the Final Acts of the World Administrative Radio Conference (WARC-92), International Telecommunications Union (Malaga-Torremolinos, 1992) ("Final Acts").

## I. THE LQSS PROPOSAL IS AN "INNOVATIVE PROPOSAL" THAT WILL LEAD TO ESTABLISHMENT OF A COMMUNICATIONS SERVICE NOT CURRENTLY PROVIDED

LQSS has applied for authority to construct a low-earth orbit satellite system that will provide radio-determination, voice and data service in the United States, Puerto Rico and the Virgin Islands, and ultimately, worldwide. The proposed system utilizes numerous innovations, including:

(1) technologies which relate to call set-up, user validation and soft call hand-offs;

(2) satellite and system design, with innovative antennas designed to compensate for the difference in the satellite-to-user link losses between the "near" and the "far" users, so that the power flux density of the "far users" is about the same as that of the "near" users, resulting in high capacity and diminution of interference into the system;

(3) unique system architecture which enables LQSS' GLOBALSTAR system to interoperate with the PSTN, to extend service from existing terrestrial infrastructures, including cellular telephone systems, with a minimum of investment; and

(4) CDMA (code division multiple access) applied to low-earth orbit satellite systems for the provision of RDSS, mobile voice and data service.

In particular, these comments focus on how use of the Qualcomm, Inc.[2] CDMA technology, to be employed for the first time in the provision of telecommunications services from low-earth orbit satellites, merits grant of a Pioneer's Preference.

These comments supplement the demonstration made in the LQSS request for Pioneer's Preference that (1) the LQSS proposal will lead to establishment of a communications service not currently provided; (2) substantial innovation is involved in the proposal (including use of Qualcomm-based CDMA technology to utilize the electromagnetic spectrum to provide by satellite voice as well as data and radiodetermination service); (3) implementation of the LQSS system will promote efficient

[2] As explained in the LQSS application, Qualcomm, Inc., is a 49 percent owner of LQSS.

use of the spectrum and an environment which will support multiple systems; and (4) the architecture of the LQSS system will enable extension of existing terrestrial telecommunications infrastructure, including cellular systems, to currently unserved areas.

## II. LQSS HAS FULFILLED THE PURPOSE OF AND THE COMMISSION'S REQUIREMENTS FOR A PIONEER'S PREFERENCE.

The Commission established a "pioneer's preference" for applicants proposing new radio services and/or new technologies enhancing existing services. The purpose of this preference, the Commission has said, is to encourage development of innovative communications technology and enhance spectrum usage. Establishment of Procedures to Provide a Preference to Applicants Proposing an Allocation for New Services, 6 FCC Rcd 3488 (1991).

In its Report and Order, the Commission outlined the requirements for obtaining the preference:

First, the applicant must request a pioneer's preference and that request must be for a proposal to introduce a new radio service, or to improve an existing service through new technology which significantly improves spectrum efficiency or enables sharing or co-use of allocated spectrum. 6 FCC Rcd at 3492, para. 37.

Second, the applicant must file a rulemaking petition requesting either that spectrum be allocated for a new service or that the Commission's rules be amended to incorporate new technology. Id.

Third, the applicant must establish, through experimentation or other means, that the proposal is technically feasible. Id., at 3493, para. 39.

On reconsideration of its Pioneer Preference rules, GEN Docket No. 90-217, FCC

92-57, released February 26, 1992, the Commission affirmed in substantial part the original rules adopted.[3] In particular, the Commission rejected the notion that an experiment is required, stating that a demonstration of technical feasibility could be submitted in lieu of an experiment. The Commission also stated that:

> If an applicant conducts an experiment to demonstrate the technical feasibility of its proposal, the findings of that experiment will be one of the major components that we will use in determining whether a tentative preference is warranted. If no experimental results are available we would not have the information needed to award a tentative preference. Id., at para. 11.

On reconsideration, the Commission reaffirmed the purpose of the Pioneer's Preference. "This process is intended to ensure that parties that develop innovative services or technologies and successfully pursue authorization of such innovations in proceedings before the Commission have an opportunity to benefit directly from their efforts." Id., at para. 2. That is the case with LQSS. LQSS has proposed an innovative service and use of innovative satellite and CDMA technologies developed by its owners.

In addition to meeting the purpose of the Pioneer's Preference, LQSS has met all the requirements for award of a preference. LQSS has:

(1) submitted a proposal that will lead to the establishment of a communications service not currently provided, e.g., RDSS, voice and data communications service provided by low-earth orbit satellites utilizing CDMA technology;

(2) developed innovative technologies, particularly CDMA, which will be utilized to provide the new communications services;

(3) filed a petition for rulemaking on November 4, 1991 to reallocate the 1610-1626.5 MHz and 2483.5-2500 MHz bands to the mobile satellite service, in which voice

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[3] LQSS, on April 6, 1992, filed a Petition for Reconsideration of the Commission's Memorandum Opinion and Order on the Establishment of Procedures to Provide a Preference to Applicants Proposing an Allocation for New Services (FCC 92-57, released February 26, 1992), raising questions with respect to the relationship of the preference and Ashbacker Radio Corp. v. FCC, 326 U.S. 327 (1945) and the scope of the preference.

and data, as well as radiodetermination and messaging service could be provided, subject to appropriate technical requirements;

(4) demonstrated in its application, rulemaking petition, request for pioneer's preference, and the record on the application, the technical feasibility of the new service and the technology to be used; and

(5) requested a preference for a nationwide service area, including the continental U.S., Alaska, Hawaii, Puerto Rico and the Virgin Islands.

## III. THE PIONEERING DEVELOPMENT OF CDMA FOR COMMERCIAL USE IN MOBILE VOICE AND DATA COMMUNICATIONS AND ITS EXTENSION TO USE FROM LOW-EARTH ORBIT SATELLITES MERITS A PIONEER'S PREFERENCE.

In looking at the Commission's objectives in the pioneer preference rulemaking, as well as in many other proceedings, it is clear that the Commission encourages:

(1) new telecommunications services which benefit the public[4];

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[4] Above 890 MHz, First Report and Order and Second Notice of Inquiry, Docket No. 18262, 35 Fed. Reg. 8644 (June 4, 1970); Second Report and Order, Docket No. 18262; 46 FCC 2d 752 (1974); reconsidered, Memorandum Opinion and Order, Docket No. 18262, 51 FCC 2d 945 (1975); aff'd sub nom. NARUC v. FCC, 525 F. 2d 630 (D.C. Cir. 1976) cert. denied, 425 U.S. 992 (1976). Personal Communications Services, Comments filed in response to the Notice of Inquiry, GEN Docket No. 90-314, 5 FCC Rcd 3995 and Petitions for Rule Making, RM-7175, filed by PCN America, November 7, 1989 and RM-7140, filed by Cellular 21, September 22, 1989; Data-PCS, Petition for Rule Making RM-7618, filed by Apple Computer, Inc., January 28, 1991; Digital Audio Broadcasting, Notice of Inquiry, GEN Docket No. 90-357, 5 FCC Rcd 5237 (1990) and Petition for Rulemaking, RM-7400, filed by Satellite CD Radio, Inc.; Low-earth Orbit Satellites above 1 GHz, Petitions for Rule Making, RM-7771, filed by Constellation Communications; RM-7773, filed by TRW Inc.; RM-7805, filed by Ellipsat Corp.; and RM-7806, filed by American Mobile Satellite Corp.

(2) innovation in telecommunications technologies;[5]

(3) telecommunications technologies which promote efficient use of the electromagnetic spectrum;[6] and

(4) multiple service providers, competition, and technologies which promote such competition, to the benefit of the public.[7]

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[5] Notice of Proposed Rulemaking in the Matter of Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, ET Docket No. 92-9, FCC 92-20 (released February 7, 1992). See also, Establishment of Procedures to Provide a Preference to Applicants Proposing an Allocation for New Services, 6 FCC Rcd 3488 (1991), reconsideration, FCC 92-57, released February 26, 1992.

[6] See, National Plan for Public Safety Services, Report and Order GEN Docket Nos. 84-1231, 84-1233, 84-1234, 2 FCC Rcd 1825 (1986); Report and Order in GEN Docket No. 87-390, 3 FCC Rcd 7033 (1988); Generic Mobile Satellite Service, Amendment of Parts 2, 22 and 25 of the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to the Use of Radio Frequencies in a Mobile Satellite Service for the Provision of Various Common Carrier Services, GEN Docket No. 84-1234, Memorandum Opinion and Order, 2 FCC Rcd 6016, 6018 (1989); Trunking in the Land Mobile Radio Services for More Effective and Efficient Use of the Spectrum, PR Docket No. 87-213, Report and Order, 5 FCC Rcd 4016 (1990); Amendment of Parts 2 and 15 of the Rules with regard the Operation of Spread Spectrum Systems; GEN Docket No. 89-354, Report and Order, 5 FCC Rcd 4123 (1990).

[7] Tel-Optik, Ltd. 100 FCC 2d 1033 (1985), (authorization of a private, non-common carrier international fiber optic submarine cable operator); Pan American Satellite Corp., 101 FCC 2d 1318 (1985) (authorization of a private, non-common carrier international satellite operator). The Record Carrier Competition Act of 1981, Pub. L.No. 97-130, 95 Stat. 1687 (1981) authorizing Western Union Telegraph Company to provide international services in competition with the international record carriers. See e.g., Hush-A-Phone v. U.S. 238 F. 2d 266 (D.C. Cir. 1956), on remand sub nom. Hush-A-Phone v. AT&T, 22 FCC 112 (1957) (establishing right of customers to attach acoustical devices to their telephones); Use of the Carterfone Device in Message Toll Service, 13 FCC 2d 420 (1968) (establishing publics' right to attach electronic devices to the PSTN); Allocation of Frequencies in the Bands Above 890 MHz, 27 FCC 359 (1959) on. recon., 29 FCC 825 (Allocation of Frequency Spectrum for Competing Microwave Radio services); Microwave Communication Inc., 18 FCC 2d 953 (1969), on recon., 21 FCC 2d 190 (authorization of carrier competition to AT&T); Regulatory Policies Concerning Shared Use and Resale of Common Carrier Services Facilities, 47 FCC 2d 644 (1974), 48 FCC 2d 1077 (1974), 60 FCC 2d 261 (1976), modified, 61 FCC 2d 70 (1976), further modification, 62 FCC 2d 588, aff'd sub nom. AT&T v. FCC, 572 FCC 2d 17 (2nd Cir. 1977), cert. den., 439 U.S. 875

Grant of LQSS' request for a pioneer's preference would achieve these objectives. As discussed below, use of CDMA technology, as developed by Qualcomm, Inc., one of the two shareholders in LQSS, will enable new services to be provided to the public, in an innovative manner, and in a manner promoting efficient use of the electromagnetic spectrum as well as multiple service providers. While some of the other requests for preference for LEO satellite systems in the RDSS bands may fulfill one or more of these objectives, LQSS alone will fulfill all of them.

## A. THE EVOLUTION OF MOBILE SERVICES AND THE NEED FOR MORE SPECTRALLY EFFICIENT TECHNOLOGIES

As the Commission is well aware, there has been an explosion in the growth of mobile services over the past decade. Use of cellular telephone service, specialized mobile radio, paging, and satellite mobile data services has grown dramatically. For mobile cellular telephone service alone, the number of users in the United States has increased from 100,000 in 1985 to 7.5 million by the end of 1991.[8] This growth is expected to continue at an exponential rate, both in the United States, and throughout the world, where such mobile services are just beginning to take off.[9]

Within the United States, many observers believe that analog cellular systems are becoming saturated. Both the Cellular Telecommunications Industry Association (CTIA)

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(1978) (authorization for shared use and resale of long distance service which created the opportunity for arbitrage); MCI Telecom. Corp. v. FCC, 561 F. 2d 365 (D.C. cir. 1977), cert. denied, 434 U.S. 1040 (1978), mandate enforced, 580 F. 2d 590 (D.C. Cir. 1978),cert. denied, 439 U.S. 980 (1978) (creating right of alternative carriers to access the public switched telephone network and provide competitive long distance telephone service.)

[8] See, U.S. Industrial Outlook 1992, U.S. Department of Commerce, at 28-8.

[9] See, Discussion of world cellular markets in The RHCs: International Ventures, Strategies and Opportunities, Leslie Taylor Associates, Phillips Publishing Co., 1990.

and the Telecommunications Industry Association (TIA) have, since the late 1980s, called for a transition to digital cellular technology. These organizations, as well as service providers, recognize the importance of and the need to increase the capacity, quality, convenience and applications of mobile systems. Already, certain cellular telephone service providers have begun to reach capacity and make plans to transition from analog to digital technology.

The existing analog cellular systems utilize Frequency Division Multiple Access (FDMA) to permit multiple users. With FDMA, the spectrum is divided into separate 30 kHz frequency channels. A user is assigned a frequency channel to communicate with a nearby cell; however, users in adjacent cells cannot be assigned to the same frequency channel or unacceptable interference will occur. As a result, the same frequency channel can be used in only one-seventh of the total cells and callers travelling between cells must be switched to a new frequency as they are handed off.

To address the requirements for the next generation of cellular systems, in September, 1988, the CTIA specified that the technology to be utilized for such systems should provide for: (1) a 10-fold increase over existing analog capacity; (2) growth potential beyond such an increase; (3) the ability to introduce new features; (4) enhanced privacy; (4) ease of transition from analog; (5) dual mode telephones; and (6) open network architecture. See, "User Performance Requirement for Digital Access," Report of Cellular Telephone Industry Association to Telecommunications Industry Association, September 12, 1988.

TIA separately developed an interim standard for the next generation of cellular systems, providing for a digital cellular access technology based upon time division multiple access(TDMA). However, this interim standard does not preclude cellular service providers from using TDMA, CDMA, or any other digital cellular technology.

In TDMA, the analog information is converting into digital data, the data is assigned

to two of six time slots on each frame on a 30 kHz frequency channel. TDMA is expected to provide up to a three-fold increase over the existing analog cellular system capacity.

A third access technique, CDMA, or code division multiple access, is derived from the spread spectrum technology used by the military in radio communications. Prior to the 1980s, CDMA was used primarily by the government where a low probability of intercept of communications or anti-jamming was desired. The military applications utilized CDMA for a small number of users, on a non-commercial basis.

## B. QUALCOMM HAS DEVELOPED CDMA FOR USE IN DIGITAL CELLULAR AND OTHER MOBILE SYSTEMS

Qualcomm, one of the two LQSS shareholders, has developed a proprietary, integrated software and hardware system for digitally transmitting telecommunication signals using CDMA. With such a system, cellular calls are coded and transmitted on a spread spectrum of 1.25 MHz.

The advantages of using Qualcomm's CDMA technology, both in a terrestrial digital cellular system, and within the Globalstar system, include:

(1) increased capacity -- 10 to 20 times over the current FDMA analog terrestrial cellular systems -- by comparison, TDMA is expected to increase capacity by up to three times the current FDMA analog system;

(2) high quality -- more error correction, less susceptibility to fading, reduced interference and soft hand-off resulting in fewer dropped calls -- e.g., more consistent high quality voice and data transmission throughout the coverage area for mobile and portable telephone operations; and

(3) soft hand-off -- analog and TDMA systems use "hard" hand-off, disconnecting a call from the current cell before connecting it to the new cell.

The innovations that have been utilized by Qualcomm to develop its version of

CDMA into a commercially viable product are embodied in 12 patents and 22 patent applications pending in the United States. Some of the key patents are:

(1) Patent #4,901,307, issued February 13, 1990, addresses application of CDMA to both cellular and satellite systems to provide higher capacity than other multiple access systems; and

(2) Patent #5,017,926 issued May 21, 1991, regarding satellite positioning (applicable to RDSS) through use of CDMA. Some of the technology embodied in this patent forms the basis for the successful OmniTRACS QASPR system, which provides position-location through a geostationary satellite.

In addition, Qualcomm has numerous patents issued, pending, or applied for, relating to various aspects of CDMA systems, including power control, soft handoff, RAKE receiver, forward link orthogonal modulation format, reverse link modulation format and others.

Qualcomm has implemented its CDMA technology in the OmniTRACS systems, which provides mobile position location and messaging service through U.S. domestic fixed satellites. Additional CDMA technology is incorporated in the systems Qualcomm is developing for digital cellular radio systems. This technology has been subject to recent field trials as discussed in Appendix C, "Summary of CDMA Field Trial Results--The CDMA Cellular System CAI Validation Test", to LQSS' Consolidated Opposition to Petitions to Deny its Application, filed on January 31, 1992.

Qualcomm also is working on application of its CDMA technology to personal communications services. In November, 1991 Qualcomm received special temporary authority on to conduct Personal Communications Service (PCS) experiments in the 1710-1765 MHz band. Authority to conduct additional PCS experiments in the 1850-1990 MHz band was granted in March, 1992.

The tests conducted pursuant to these authorizations are a part of on-going

Qualcomm experiments, tests and field trials to verify various elements of each type of system it has under development.

In implementing the GLOBALSTAR system, LQSS will utilize Qualcomm's existing CDMA technologies developed to date as well as additional CDMA technologies for the ground and space segment developed specifically for that system, as described in the LQSS application.

### C. QUALCOMM-DEVELOPED CDMA TECHNOLOGY WILL ENABLE THE GLOBALSTAR SYSTEM TO OPERATE WITH HIGH-CAPACITY, HIGH-QUALITY, SPECTRAL EFFICIENCY AND ABILITY TO SHARE SPECTRUM WITH OTHER SYSTEMS

The next stage in the application of CDMA, e.g., to low-earth orbit systems, will enable implementation of high-quality, high-volume voice, data and RDSS service from GLOBALSTAR. Use of CDMA technology in this system will provide the benefits outlined above.

Within the GLOBALSTAR system, the following capabilities will be made possible through the use of innovative CDMA:

(1) the ability to concentrate signals in single beams to dynamically assign capacity to address variations in demand or emergency situations;

(2) the ability to optimize elevation angles for users by using CDMA to control timing of call hand-offs;

(3) the ability to avoid blockage by selecting the best signal path or by utilizing multiple paths;

(4) high-quality -- better error correction, less susceptibility to fading, similar to the case for terrestrial cellular systems; and

(5) soft call hand-off -- to avoid disconnecting a user moving between cells and for providing less perceptible hand-offs.

In particular, use of Qualcomm-developed CDMA technology will permit the Commission to realize some of its most important objectives, namely, encouragement of spectrum-efficient technologies as well as provision of opportunity for multiple service providers. The Commission has repeatedly found that, with few exceptions, the public is best served when it has a choice among service providers. This choice promotes variety in the services offered, lower prices and higher quality.[10]

## IV. TO COMPORT WITH THE WARC-92 RESULTS AND TO PROVIDE FOR MULTIPLE LEO SYSTEMS, LQSS SHOULD RECEIVE A PIONEER'S PREFERENCE.

The 1992 World Administrative Radio Conference, which concluded on March 3, 1992, allocated the 1610-1626.5 MHz and 2483.5-2500 MHz bands to the Mobile Satellite Service on a primary basis in all three regions of the world. This allocation was achieved through worldwide cooperation based on a commitment by the United States that the spectrum allocation would support multiple low-earth orbit systems.

To fulfill the commitment made by the United States to the international community, which led to attainment of this key objective at the Conference, the path for the Commission is clear. The Commission must provide for operation of multiple systems in the bands allocated. Thus, the Commission can grant a pioneer's preference only to systems, such as LQSS', which provide for multiple entry of both United States and non-United States systems in the 1610-1626.5 MHz and 2483.5-2500 MHz bands.

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[10] See, e.g., proceedings cited in Footnote 7, infra.

At WARC-92, the United States delegation, under the leadership of Ambassador Jan Baran, was directed to work with all other delegations, and with INMARSAT, to provide information concerning other proposed U.S. systems and technical details concerning the feasibility of spectrum sharing by systems, including those that might be proposed by other administrations or by a group of administrations. LQSS, along with Constellation, TRW and Ellipsat, provided this support to the U.S. effort. It was only through these efforts, as well as key negotiations with the Russian Federation concerning feasibility of sharing with the Russian GLONASS (global positioning system) that attainment of the needed support for the allocations of the 1610-1626.5 MHz (Earth-to-space) and 2483.5-2500 MHz (space-to-Earth) on a primary basis for mobile satellite service throughout the world was achieved. This achievement was based on the commitment of the United States that the allocations would be available for a service, e.g., mobile satellite, not for a single system such as Motorola's.

To accommodate multiple systems, pursuant to the United States commitment at WARC-92, the entire 1610-1626.6 MHz band must be allocated for all systems that request the full bandwidth. This is necessary to enable the frequency adjustments that will be required on a dynamic basis to enable coordination between the CDMA systems and radio-astronomy installations, as well as with GLONASS receivers.[11]

[11] With regard to sharing between low-earth orbit systems in the RDSS bands, INMARSAT has implicitly recognized the need for the full 1610-1626.5 MHz band in its recent filing for both geostationary and low-earth orbit systems with the International Frequency Registration Board.

INMARSAT also has indicated that CDMA may be required to enable sharing in the RDSS bands. INMARSAT, on March 9, 1992, provided a document to the INMARSAT Council on the results of WARC-92 and INMARSAT's Project 21 which states that "[T]he coordination and sharing requirements [of the WARC results] also imply that the signal formats adopted for Project 21 should facilitate sharing as much as possible. Thus, a CDMA signal in separate up and down bands seems at this stage to be preferable to a TDMA bidirectional approach."[12]

The United States, at WARC-92, emphasized that it sought an allocation for a service, not a system. In order to live up to this commitment, it must, as it moves forward with consideration of the requests for pioneer's preference in this proceeding, the rulemaking petitions, and the applications, allow for systems which can share, rather than monopolize spectrum.

LQSS submits that its proposal would establish such a framework, and moreover, should receive a pioneer's preference for the key innovations in the use of CDMA contained within its system proposal.

## VI. CONCLUSION

[12] INMARSAT Council, Document COUNCIL/42/19/ADD/1, 9 March 1992, origin: Director General.

For the above-stated reasons, and those stated in its application, Pioneer's Preference request, petition for rulemaking, related records, the results of WARC-92, and to comport with Commission policies, LQSS urges the Commission to recognize the pioneering work of its shareholder, Qualcomm, Inc., leading to key developments in CDMA which form the basis for the innovation of applying this spectrally-efficient technology to the provision of voice, data and RDSS service through low-earth orbit satellites.

Respectfully submitted,

Loral Qualcomm Satellite Services, Inc.

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April 8, 1992

CERTIFICATE OF SERVICE

I, Andrew Taylor, hereby certify that I have on this 8th day of April, 1992, caused to be sent copies of the foregoing "Comments in Support of Request for Pioneer's Preference" by U.S. mail, postage prepaid, to the following:

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