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Satellite Policy Branch
International Bureau

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GUILLEN-LLARENA, S.C.

December 22, 1997

33/34-SAT-L0I-98

Magalie Roman Salas
Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Dear Ms. Salas:

Enclosed please find an original plus 9 copies (plus one stamp and return copy) of the Pacific Century Group Letter of Intent as a Foreign Satellite Operator to Provide Fixed Satellite Services in the Ka-Band to the United States. Please note that there is no fee associated with this filing, since it is a Letter of Intent and not a license application. Further, please note that we have filed facsimile copies of the Form 312 certification, as well as the general certification and affidavit, of George Chan. Original signature pages will be filed with the Commission shortly.

If you have any questions regarding the foregoing, please contact the undersigned.

Sincerely,

Tara K. Giunta, Esq.

Enclosures
Copy: Thomas Tycz
Fern Jarmulnek
Harry Ng
Steve Sharkey
Kathleen Campbell

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Magalie Roman Salas
Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Pacific Century Group Letter of Intent as a Foreign Satellite Operator to Provide Fixed Satellite Services in the Ka-Band to the United States

Dear Ms. Salas:

The Pacific Century Group, Inc. ("PCG"), by its attorneys, hereby advises the Federal Communications Commission ("FCC" or "Commission") through this Letter of Intent ("LOI")[1] of its interest and intention to provide advanced broadband communications satellite services to information services providers, and business and residential users throughout the Continental United States of America ("CONUS").

PCG's USA network will consist of four satellites, located in pairs at 89 degrees West and 82 degrees West longitude and using frequencies which the FCC has designated for Ka-band geostationary satellite services.[2] PCG's satellite system will constitute the primary

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[1] *See*, Satellite Applications Accepted for Filing in the Ka-band, Public Notice, Report No. SPB-106, DA 97-2202 (rel. Oct. 15, 1997) ("*Ka-Band Public Notice*").

[2] *See*, Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Relocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *Third Report and Order*, CC Docket No. 92-297, FCC 97-378 (rel. Oct. 15, 1997) ("*Ka-Band Third Report and Order*"). *See also*, *First Report and Order*, FCC 96-311 (1996).

distribution platform for services provided over an integrated global network.[3] This system will make optimal use of existing advanced terrestrial and conventional satellite technologies in combination with its own, specially-designed high-powered Ka-band satellites, in order to deliver an array of services characteristic of those envisioned as primary on the Global Information Superhighway. This network will take advantage of the asymmetrical nature of most Internet, multimedia-type communications, electronic commerce and other advanced information-driven communications applications by combining the efficiencies and infrastructure, where available, of the terrestrial telecommunications network with the broad coverage possible from geostationary satellites.

The PCG USA network will provide domestic, non-common carrier services primarily to information services providers and resources seeking access to either broad or niche markets, throughout CONUS. The four PCG satellites serving the USA market will be part of a global satellite and terrestrial network covering nearly 100 percent of the world's population. Interconnection among satellites will occur either via the terrestrial network or at shared satellite uplink facilities. PCG does not plan to use direct intersatellite links.

Elsewhere around the world, where terrestrial infrastructure does not exist, the PCG satellite network will be configured to provide both basic connectivity, as well as advanced services currently available or proposed in developed countries. Through PCG, those portions of the world's population not yet connected to the global telecommunications network will be able to share in the same benefits of the Information Age now being enjoyed by the United States, Japan and the European Union. PCG believes it is critical that these underserved populations have the opportunity to access the information resources available in developed countries, in order to further their development and integration into the global economy. In turn, developed countries, through the PCG network, will have the opportunity to receive and send information to populations which have been poorly-served by the global telecommunications and information infrastructure.

This advanced satellite and terrestrial network will be under the control and management of PCG, a diversified group with activities in property development, financial services (investment banking and venture capital), insurance, and media and telecommunications services. PCG is owned principally (over 90%) by Richard Li, the founder of StarTV and other media and telecommunications ventures. Facing enormous odds and governmental resistance, StarTV was the first satellite television venture to provide broad coverage of the Asian mainland starting in 1991. The result was that 3 billion people in more than 50 nations were provided an alternative to the largely state-run television channels to which they had previously been restricted.

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[3] PCG is conducting its Ka-Band business through several intervening, wholly-owned subsidiaries, all of which are located in the United Kingdom and British dependent territories.

Senior managers from both StarTV and AsiaSat joined Mr. Li in founding PCG in 1994, after selling two-thirds of StarTV to News Corporation. Mr. Li later sold the remaining interest in StarTV to News Corp., netting from both transactions nearly three-quarters of a billion dollars. Mr. Li has remained interested in the challenge of bringing advanced services to the underserved of the world and has pioneered efforts to break down regulatory barriers in Asia. Mr. Li, through PCG, founded Pacific Century Corporate Access, a Singapore-based affiliate, which sought for the first time to offer business users competitive, satellite-based private international telecommunications services outside of existing public telecommunications organization ("PTO") monopolies and concessions. This affiliate was later sold to Hutchison Telecommunications Limited, the telecommunications operations arm of the Li-family-controlled Hutchison Whampoa Limited trading company, of Hong Kong. Mr. Li, through PCG, has continued to pursue advanced satellite-based solutions for the information and telecommunications challenges of the current era. Mr. Li, like other billionaires involved in satellite ventures, has the vision, drive and financial resources to implement the global satellite networks which will change the way Mankind communicates and is informed.

Mr. Li is also a principal shareholder (via the Li Family Trust) and Deputy Chairman of the family-controlled Hutchison Whampoa Limited trading company. Hutchison Whampoa is broadly diversified into retailing, port operations, energy production, telecommunications, property development and management, hotel development and management and other commercial activities. Hutchison and its affiliated companies have over 50,000 employees and tens of billions of dollars in assets, annual revenues and profits. Over 13,000 employees work in the telecommunications activities of Hutchison Whampoa. A summary of Mr. Li's and the Li family's holdings are summarized in Exhibit X to Attachment B of this LOI.

PCG submitted Advanced Publication filings with the International Telecommunication Union ("ITU") in 1994 for its Ka- and X-band global satellite system, through the U.K. Administration.[4] PCG is subject to the U.K. Administration's precedent-setting Due Diligence Procedures described in Annex 2 of Attachment C to this LOI. It has worked closely with the U.K. Administration and the Radiocommunications Agency, to vigorously pursue its ITU filings and subsequent Requests for Coordination. PCG has held numerous coordination meetings and maintains an ongoing schedule of such meetings. PCG met with the National Telecommunications and Information Administration ("NTIA") in July 1997, and another meeting is planned for early 1998 in London with representatives of NTIA, the FCC

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[4] The filings to the ITU were submitted through PCG affiliates organized in Bermuda, a British Dependent Territory and under the jurisdiction of the U.K. Administration. Thus, the U.K. is the home Administration for PCG's satellite system. *See*, Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States, *Report and Order*, IB Docket No. 96-111, FCC 97-399, at ¶ 53 (rel. Nov. 26, 1997) ("*DISCO II Report and Order*").

and USA operators. The U.K., as part of the European Union, is a principal signatory to the World Trade Organization's ("WTO") Basic Telecommunications Agreement of February 15, 1997. The U.K. maintains one of the most open telecommunications markets in the world and has developed a sophisticated regulatory regime in order to manage it.

In selecting orbital locations for its global satellite network, PCG sought locations with at least 10 degrees of orbital separation from other systems which had filed Advanced Publication information or Requests for Coordination with the ITU. Through its vigorous due diligence in pursuing publication and coordination of its satellites, PCG has maintained its priority within the ITU processing system. PCG notes that the FCC has more recently assigned U.S.-licensed Ka-band satellites to the same or immediately adjacent orbital locations for which PCG has submitted Advanced Publication and Request for Coordinations to the ITU.[5] PCG here and in Attachment C states its acceptance of the FCC's objective of efficient use of the geostationary orbit and related Ka-band radio frequencies, including the objective of 2 degree spacing. As noted, PCG is pursuing coordination meetings with USA satellite operators and the United States Administration. However, PCG believes that the FCC should realign its recent orbital deployment plans, respecting PCG's priority within the ITU process and the U.K. Administration's participation in the WTO, especially the Basic Telecommunications Agreement.[6]

In subsequent pages, PCG presents its credentials as stipulated by the FCC's public notice announcing a December 22, 1997 filing window for Ka-band satellite systems and other

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[5] *See*, Assignment of Orbital Locations to Space Stations in the Ka-Band, *Order*, DA 97-967 (rel. May 9, 1997); Comm, Inc. Application for Authority to Construct, Launch, and Operate a Ka-Band Satellite System in the Fixed-Satellite Service, *Order and Authorization*, DA 97-968 (rel. May 9, 1997) ("*Comm Inc. Order*") (authorization to operate at 87° W.L.); Echostar Satellite Corporation Application for Authority to Construct, Launch, and Operate a Ka-Band Satellite System in the Fixed-Satellite Service, *Order and Authorization*, DA 97-969 (rel. May 9, 1997) ("*Echostar Order*") (authorization to operate at 83° W.L.); Orion Network Systems, Inc. Application for Authority to Construct, Launch, and Operate a Ka-Band Satellite System in the Fixed-Satellite Service, *Order and Authorization*, DA 97-977 (rel. May 9, 1997) ("*Orion Order*") (authorization to operate at 81° W.L.).

[6] *See*, *DISCO II Report and Order*, at ¶¶ 39-40. The Commission has consistently indicated that temporary assignments of any orbital location are subject to change by summary order on 30 days' notice, and that these orbital assignments do not confer any permanent right to use the orbit and spectrum. *See*, *Comm, Inc. Order*, at ¶ 42; *Echostar Order*, at ¶ 38; *Orion Order*, at ¶ 37. Relocation by the Commission of orbital assignments would not constitute a burden to the licensees since these proposed Ka-Band systems have yet to be launched and are likely not under construction.

related guidance for filing LOIs.[7] PCG stands ready to answer any questions to the best of its ability with deference to its obligation to the U.K. Administration and its rights as a privately-held foreign corporation. Attached to this LOI are the following:

Attachment A -	FCC Form 312
Attachment B -	Review of Appropriate Section 25.114 and 25.140 Information Requests
Attachment C-	Technical Description of PCG USA Ka-band Satellite System

Respectfully submitted,

Tara K. Giunta
Counsel for Pacific Century Group

Copy: Thomas Tycz
Fern Jarmulnek
Harry Ng
Steve Sharkey
Kathleen Campbell

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[7] *See*, *Ka-Band Public Notice*; *Ka-Band Third Report and Order*. *See also*, International Bureau Announces Anticipated Procedures for Foreign Satellites to be Considered in Processing Rounds, Public Notice, Report No. SPB-80, DA 97-944, 12 FCC Rcd. 5010 (1997).

ATTACHMENT A

FCC FORM 312

MAIN FORM

FCC 312
Main Form

FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS

Approved by OMB 3060-0678
Est. Avg. Burden Hours Per Response: 10 Hrs.

FCC Use Only
File Number:
Call Sign:

PAYOR AND FILING FEE INFORMATION

a. Payor Name: N/A			b. Daytime Telephone Number
c. Mailing Street Address or P.O. Box			d. FCC Account Number
e. City	f. State	g. Zip Code	h. Country Code (if not U.S.A.)

i. Payment Type Code	j. Quantity	k. Fee Due for Payment Type Code in (i)	l. Total Amount Paid	FCC Use Only

APPLICANT INFORMATION

1. Legal Name of Applicant: Pacific Century Group, Inc.	2. Voice Telephone Number: (345) 949-4900
3. Other Name Used for Doing Business (if any)	4. Fax Telephone Number: (345) 945-7388
5. Mailing Street Address or P.O. Box: P.O. Box 2804, Huntlaw Bldg., Fort Street ATTENTION: Ray Kennedy	6. City: George Town, Grand Cayman 7. State / Country (if not U.S.A.): Cayman Islands, B.W.I. 8. Zip Code:
9. Name of Contact Representative (If other than applicant): Tara K. Giunta, Esq.	10. Voice Telephone Number: (202) 736-1809
11. Firm or Company Name: Coudert Brothers	12. Fax Telephone Number: (202) 775-1168
13. Mailing Street Address or P.O. Box: 1627 I Street, N.W. ATTENTION:	14. City: Washington 15. State / Country (if not U.S.A.): D.C. 16. Zip Code: 20006

CLASSIFICATION OF FILING

17. Place an "X" in the box next to the classification that applies to this filing for both questions a. and b. Mark only one box for 17a and only one box for 17b.

- [ ] a1. Earth Station
- [X] a2. Space Station

- [ ] b1. Application for License of New Station
- [ ] b2. Application for Registration of New Domestic Receive-Only Station
- [ ] b3. Amendment to a Pending Application
- [ ] b4. Modification of License or Registration
- [ ] b5. Assignment of License or Registration
- [ ] b6. Transfer of Control of License or Registration
- [ ] b7. Notification of Minor Modification
- [X] b8. Other (Please Specify): Letter of Intent

18. If this filing is in reference to an existing station, enter:
Call sign of station:

19. If this filing is an amendment to a pending application enter:
(a) Date pending application was filed:
(b) File number of pending application:

ALIEN OWNERSHIP

29. Is the applicant a foreign government or the representative of any foreign government?	☐ YES	☒ NO
30. Is the applicant an alien or the representative of an alien?	☒ YES	☐ NO
31. Is the applicant a corporation organized under the laws of any foreign government?	☒ YES	☐ NO
32. Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	☒ YES	☐ NO
33. Is the applicant a corporation directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	☒ YES	☐ NO
34. If any answer to questions 29, 30, 31, 32 and/or 33 is Yes, attach as Exhibit C an identification of the aliens or foreign entities, their nationality their relationship to the applicant, and the percentage of stock they own or vote. See Exhibit C		

BASIC QUALIFICATIONS

35. Does the applicant request any waivers or exemptions from any of the Commission's Rules? If Yes, attach as Exhibit D, copies of the requests for waivers or exceptions with supporting documents. See Exhibit D	☒ YES	☐ NO
36. Has the applicant or any party to this application had any FCC station authorization or license revoked or had any application for an initial, modification or renewal of FCC station authorization, license, or construction permit denied by the Commission? If Yes, attach as Exhibit E, an explanation of the circumstances.	☐ YES	☒ NO
37. Has the applicant, or any party to this application, or any party directly or indirectly controlling the applicant ever been convicted of a felony by any state or federal court?	☐ YES	☒ NO
38. Has any court finally adjudged the applicant, or any person directly or indirectly controlling the applicant, guilty of unlawfully monopolizing or attempting unlawfully to monopolize radio communication, directly or indirectly, through control of manufacture or sale of radio apparatus, exclusive traffic arrangement or any other means or unfair methods of competition?	☐ YES	☒ NO
39. Is the applicant, or any person directly or indirectly controlling the applicant, currently a party in any pending matter referred to in the preceeding two items?	☐ YES	☒ NO
40. By checking Yes, the undersigned certifies, that neither the applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application" for these purposes.	☒ YES	☐ NO

41. Description. (Summarize the nature of the application and the services to be provided).

Pacific Century Group, Inc., through this Letter of Intent, proposes to use non-U.S. space stations to provide fixed satellite services to, from and within the United States in order to be considered in the second Ka-Band processing round. The satellites will operate at 89 degrees West and 82 degrees West for service to, from and within the United States in the Ka-Band.

CERTIFICATION

The Applicant waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application. The applicant certifies that grant of this application would not cause the applicant to be in violation of the spectrum aggregation limit in 47 CFR Part 20. All statements made in exhibits are a material part hereof and are incorporated herein as if set out in full in this application. The undersigned, individually and for the applicant, hereby certifies that all statements made in this application and in all attached exhibits are true, complete and correct to the best of his or her knowledge and belief, and are made in good faith.

42. Applicant is a (an): (Please an "X" in the box next to applicable response.)

[ ] a. Individual [ ] b. Unincorporated Association [ ] c. Partnership [X] d. Corporation [ ] e. Governmental Entity [ ] f. Other (Please specify) _____

43. Typed Name of Person Signing	44. Title of Person Signing
George Chan	Executive Vice President
45. Signature	**46. Date**
George Chan	12/22/97

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).

Ownership Information

Pacific Century Group, Inc. is incorporated in the Cayman Islands, a British dependent territory, with offices located at P.O. Box 2804, Huntlaw Building, Fort Street, George Town, Grand Cayman, Cayman Islands, B.W.I. Pacific Century Group, Inc. is wholly-owned by Pacific Century Group ("PCG"), a diversified group of companies based in Hong Kong with offices at 38th Floor, Citibank Tower, Citibank Plaza, 3 Garden Road, Central, Hong Kong. Richard Li, a Canadian citizen, owns over 90% of PCG. The PCG USA System is held by intervening holding companies located in the United Kingdom and British dependent territories, all of which are wholly-owned subsidiaries of PCG.

Mr. Li founded StarTV in 1991 and has been involved in other media and telecommunications ventures. In 1994, Mr. Li founded PCG, after selling two-thirds of StarTV to News Corporation. Mr. Li later sold the remaining interest in StarTV to News Corp., netting from both transactions nearly three-quarters of a billion dollars. Mr. Li, through PCG, founded Pacific Century Corporate Access, a Singapore-based affiliate, which (again for the first time) offered business users competitive, satellite-based private international telecommunications services. This affiliate was later sold to Hutchison Telecommunications Limited, the telecommunications operations arm of the Li family-controlled Hutchison Whampoa Limited trading company, of Hong Kong. Mr. Li, through PCG, has continued to pursue advanced satellite-based solutions for the information and telecommunications challenges of the current era. Mr. Li, like other billionaires involved in satellite ventures, has the vision, drive and financial resources to complete this global satellite network.

Mr. Li is also a principal shareholder (via the Li Family Trust) and Deputy Chairman of the family-controlled Hutchison Whampoa Limited trading company. Hutchison Whampoa is broadly diversified into retailing, port operations, energy production, telecommunications, property development and management, hotel development and management, and other commercial activities. Hutchison Whampoa and its affiliated companies have over 50,000 employees and tens of billions of dollars in assets, annual revenues and profits. Over 13,000 employees work in its telecommunications ventures. A summary of Mr. Li's and the Li family's holdings are summarized in Annex 1 to Attachment B of this LOI.

Requests for Waivers of the Commission's Rules

As noted in Attachment B, in the event the Commission determines that Pacific Century Group's ("PCG") financial showing is deficient, PCG hereby respectfully requests that the FCC grant a waiver of Section 25.114(c)(13) of Part 25 of the Commission's Rules. Support for this request is fully described in Attachment B, in response to 47 C.F.R. §25.114(c)(13).

As noted in Attachment B, footnote 1, PCG's deployment schedule comports with the requirements of Section 25.145(f) regarding implementation milestones for Ka-Band FSS systems. Section 25.145 will come into effect during the review of this and other LOIs and applications filed by December 22, 1997. PCG requests that the FCC grant a waiver in order to maintain the proposed milestone and launch schedule.

ATTACHMENT B

COMPLIANCE WITH SECTIONS 25.114 AND 25.140

Compliance with 47 C.F.R. §25.114

(a) This Letter of Intent, including FCC Form 312 and all attachments and exhibits, constitutes a comprehensive proposal for a consolidated satellite system.

(b) This Letter of Intent, including FCC Form 312 and all attachments and exhibits, constitute a concrete proposal. Alternative orbital locations, while requested as an option, are not proposed here because the two orbital positions covered by this Letter of Intent have already been published as Advanced Information and as Requests for Coordination through the International Telecommunication Union ("ITU"). Coordination meetings have already begun. Therefore, it would be inappropriate to offer a range of alternatives at this time, because Pacific Century Group maintains its priority in the ITU process for 89 and 82 degrees West locations. For the formal waiver required by 47 U.S.C. §304, see signature on Certification at the end of Attachment A, FCC Form 312. For the Technical Description, see Attachment C.

(c) (1) Pacific Century Group, Inc.
P.O. Box 2804
Huntlaw Building
Fort Street
George Town
Grand Cayman, Cayman Islands
B.W.I.

(345) 949-4900

(2) Tara K. Giunta, Esq.
Coudert Brothers
1627 I Street, N.W.
Washington, D.C. 20006

(202) 736-1809

(3) Letter of Intent for four satellites to be located in pairs at 89 degrees West and 82 degrees West to provide non-common carrier services.

(4) Pacific Century Group ("PCG") is establishing a global network, using geostationary satellites operating in Ka-band frequencies to service the digital communications market, such as Internet and other multimedia data services. For a full description of the overall system facilities, operations and services, see the Letter of Intent and Attachment C.

(5) For a full description of the information required by Section 47 C.F.R. § 25.114(c)(5), see Attachment C.

(6) (i) See Attachment C.

(ii) Not applicable.

(iii) Not applicable.

(7) See Attachment C.

(8) See Attachment C.

(9) See Attachment C.

(10) See Attachment C.

(11) See Attachment C.

(12) See Attachment C.

(13) Financial Information:

For a complete description of the estimated costs to construct, launch and operate the PCG satellite system, see Attachment C. As noted in Form 312, Exhibit C, Pacific Century Group, Inc. is a wholly-owned subsidiary of Pacific Century Group (PCG). PCG was founded in 1994 by Mr. Richard Li and is owned (over 90%) by Richard Li. Mr. Li, a citizen of Canada, is PCG's Chairman and Chief Executive. Mr. Li's holdings are broad-ranging and legendary, and include companies involved in media and technology, financial services, property investments and insurance. See Annex 1 to this Attachment B. Mr. Li is most notably associated with StarTV, the first pan-Asian satellite television network, which he founded in 1991. The StarTV network developed an audited audience of 50 million subscriber homes in the first 36 months on the air, gaining an average of 46,000 new subscriber households per day for three years. Today, StarTV is viewed by more than 220 million people in 63 countries. In 1993, Mr. Li negotiated the sale of 63.6% of StarTV to News Corp. for US$525 million. In 1995, he completed the sale of the remaining 36.4% interest in StarTV to News Corp. for US$346 million. Total investment to sale-date was all equity, financed at US$125 million.

The United Kingdom Administration is the ITU Administration for PCG's satellite system,[1] and as such, has filed PCG's Advanced Publication Information and Request for Coordination with the ITU. For a fuller description of PCG's ITU coordination status, see Annexes 1 and 2 of Attachment C. The U.K. is a member of the World Trade Organization ("WTO") and has signed the WTO Basic Telecommunications Agreement. The U.K. regulatory procedures are well-known and well-regarded internationally. The U.K. has taken the lead in Europe in promoting due diligence procedures, instituting a formal process in 1996 to ensure that operators prosecuting ITU filings through it have the legal, technical and financial competence to establish their networks. For a fuller description of the U.K. procedures, see Annex 2 of Attachment C.

The FCC reviews LOIs for purposes of deciding, not whether to issue a license but, rather, whether to reserve or designate frequencies and orbital locations, or both, for possible use by a foreign satellite operator seeking access to the U.S. market. As acknowledged by the Commission, it will not be reviewing the basic qualifications of LOI filers, as it would if they were applying for a license.[2] The U.K. Administration is conducting its own comprehensive review of PCG's qualifications (legal, technical and financial) as a U.K system. Additional, detailed review of PCG's basic qualifications by the Commission is not only redundant, but unnecessary, in order to coordinate frequencies and orbital locations. Therefore, nothing further should be required here by the FCC than has been provided by PCG in this LOI.

To the extent that the Commission believes that it is entitled to additional information regarding PCG's basic qualifications, including financial information, PCG respectfully requests a waiver of those requirements.[3] For the reasons cited above, PCG submits that good cause exists for a waiver of the rules. If all or any part of this waiver request is

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[1] *See*, Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States, *Report and Order*, IB Docket No. 96-111, FCC 97-399, at ¶ 53 (rel. Nov. 26, 1997) ("*DISCO II Report and Order*").

[2] "[T]he Commission stated that it did not intend to issue separate (and duplicative) U.S. licenses for those space stations under the jurisdiction of another licensing or coordinating administration." *DISCO II Report and Order*, at ¶ 183. This argument was supported by commenters in the Commission's *Notice* and *Further Notice* stages of the *DISCO II* proceeding. Further, the Commission stated that it would "not issue a separate, and duplicative, U.S. license for a non-U.S. space station. Issuing a U.S. license would raise issues of national comity, as well as issues regarding international coordination responsibilities for the space station." *Id.* at ¶ 188.

[3] 47 C.F.R. §1.3 (1996).

denied, PCG respectfully requests that the Commission provide it with at least 30 days to amend this LOI accordingly, without prejudice.

(14) All transponders on the PCG satellite system will be provided on a non-common carrier basis, under individually negotiated, long term private contracts with information service providers and other service provider customers.

(15) See Attachment C.

(16) The public interest is directly served by granting PCG's LOI and authorizing PCG to provide service in the U.S. PCG's innovative approach to the design of the space segment and its integrated terrestrial and space-based network is well-suited to the U.S., with its highly-developed terrestrial telecommunications infrastructure.

By making the satellite system a specially-designed component of an integrated digital information delivery platform, PCG has combined the best attributes of both media: the natural reach and high bandwidth capabilities of satellites (which are eminently suitable for forward path, high volume, high speed, point-to-multipoint data distribution) together with the highly interconnected, but lower bandwidth properties of the existing terrestrial public and private networks (which are eminently suitable for the backward path, point-to-point, low volume, low speed, data delivery). Additionally, PCG's spot beam and on board switching technology further enhances each satellite's natural reach, by providing a significant amount of selectivity over the geographic distribution of the forward path data.

PCG's unique approach will promote the speedier development of a whole range of emerging services, from high speed Internet delivery, home shopping, specialist data base distribution, through to electronic commerce, and similar advanced services. The development of many of these services is being hampered by a lack of adequate bandwidth to the users' premises -- even in the U.S. with its highly-developed infrastructure.

By making use of the existing terrestrial networks for the backward path, PCG will stimulate increased, and hence more efficient use, of those networks. It will in many cases enable terrestrial operators to extend the life of their existing networks and will also promote new investment in those networks. Further, PCG's delivery platform will stimulate competition for the provision of a wide range of services, keeping prices to the consumer at affordable levels. Moreover, PCG's digital information delivery platform will support tens of millions of users, both by direct end user reception via PCG's 65 cm receiving terminals, as well as by terrestrial cable and wireless distribution. PCG's networks will stimulate local economies by fostering the establishment of such information supply and information intensive businesses.

PCG's digital information delivery platform will foster the development of new technologies in three areas:

Satellites: PCG's innovative payload, antenna architecture and high power requirements will extend the frontiers of existing designs.

Subscriber terminals: PCG's design calls for high speed 250 Mbps receive-only terminals consisting of wideband, low noise r.f., down conversion, high speed demodulation, high speed demultiplexing, multiple protocol data, processing conditional access and user device interface components, all at affordable consumer level prices.

Network Control: PCG's network will require a fully integrated network control subsystem comprising a sophisticated combination of hardware and software elements not previously attempted. This subsystem is required to manage major items such as:

- terrestrial data routing
- terrestrial data multiplexing
- satellite data routing
- customer data bases
- billing
- logging and data analysis

This network will expand, as PCG brings other satellites in its global network into operation.

PCG is currently in negotiations with manufacturers and other vendors around the world for significant purchases of the components of PCG's global network. Final decisions will be influenced by the speed with which, and openness attached to, landing rights and other authorizations issued to PCG from administrations in key markets.

(17) See below for information requested by 47 C.F.R. §25.140.

(18) Not applicable.

(19) Not applicable.

(20) Not applicable.

(21) Not applicable.

(d) Not applicable.

Compliance with 47 C.F.R. §25.140
(in accordance with 47 C.F.R. § 25.114(c)(17))

(a) See below.

(b) For PCG's demonstration that it is legally, financially, technically and otherwise qualified, refer to this Letter of Intent, FCC Form 312 and all attachments and exhibits.

(1) See above for information specified in 47 C.F.R. §25.114.

(2) See Attachment C.

(3) See Attachment C.

(4) See Attachment C.

(c) See above response to 47 C.F.R. §25.114(c)(13). See attached affidavit of George Chan, Executive Vice President of PCG, Inc.

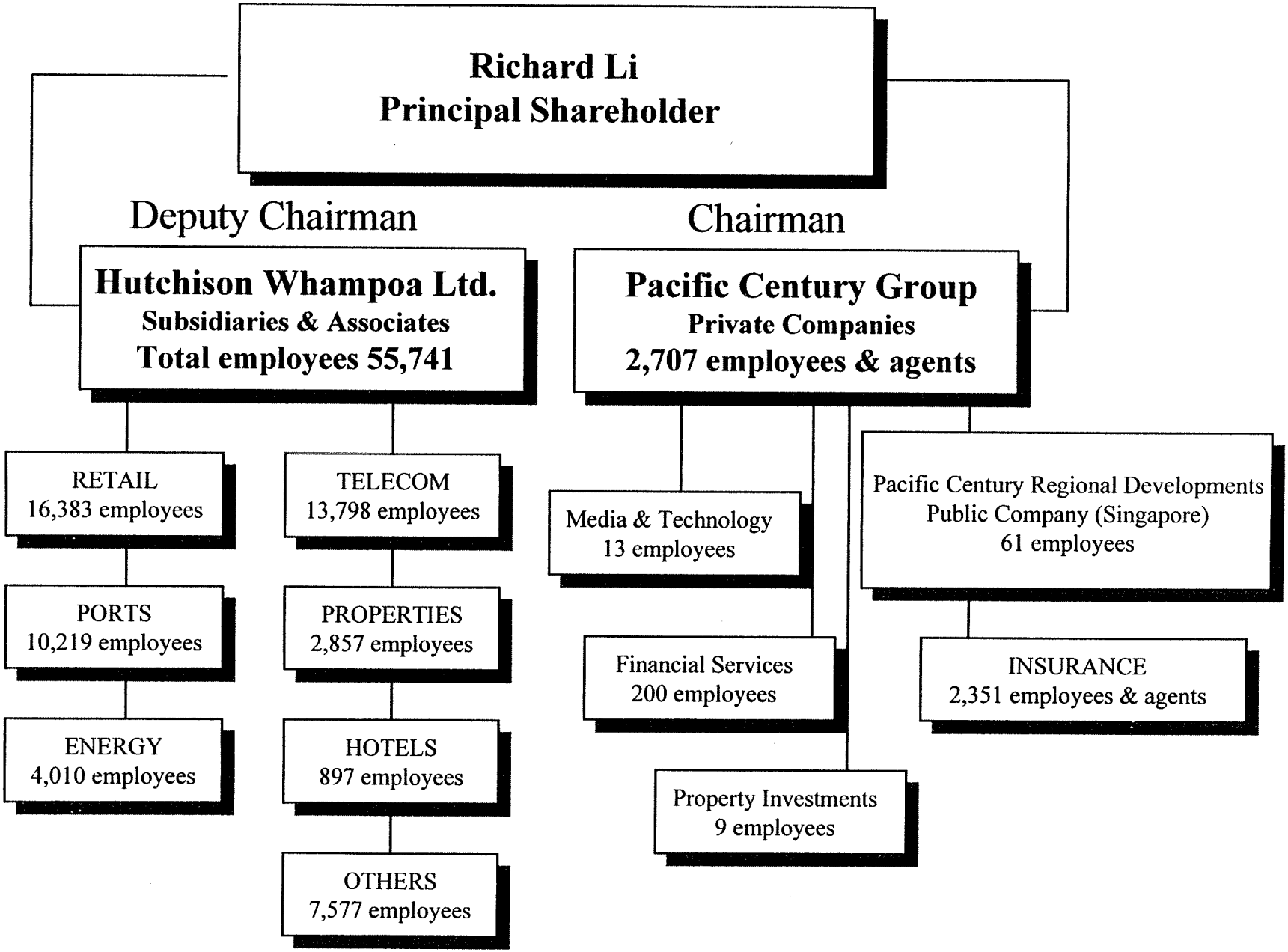
(d) Not applicable.

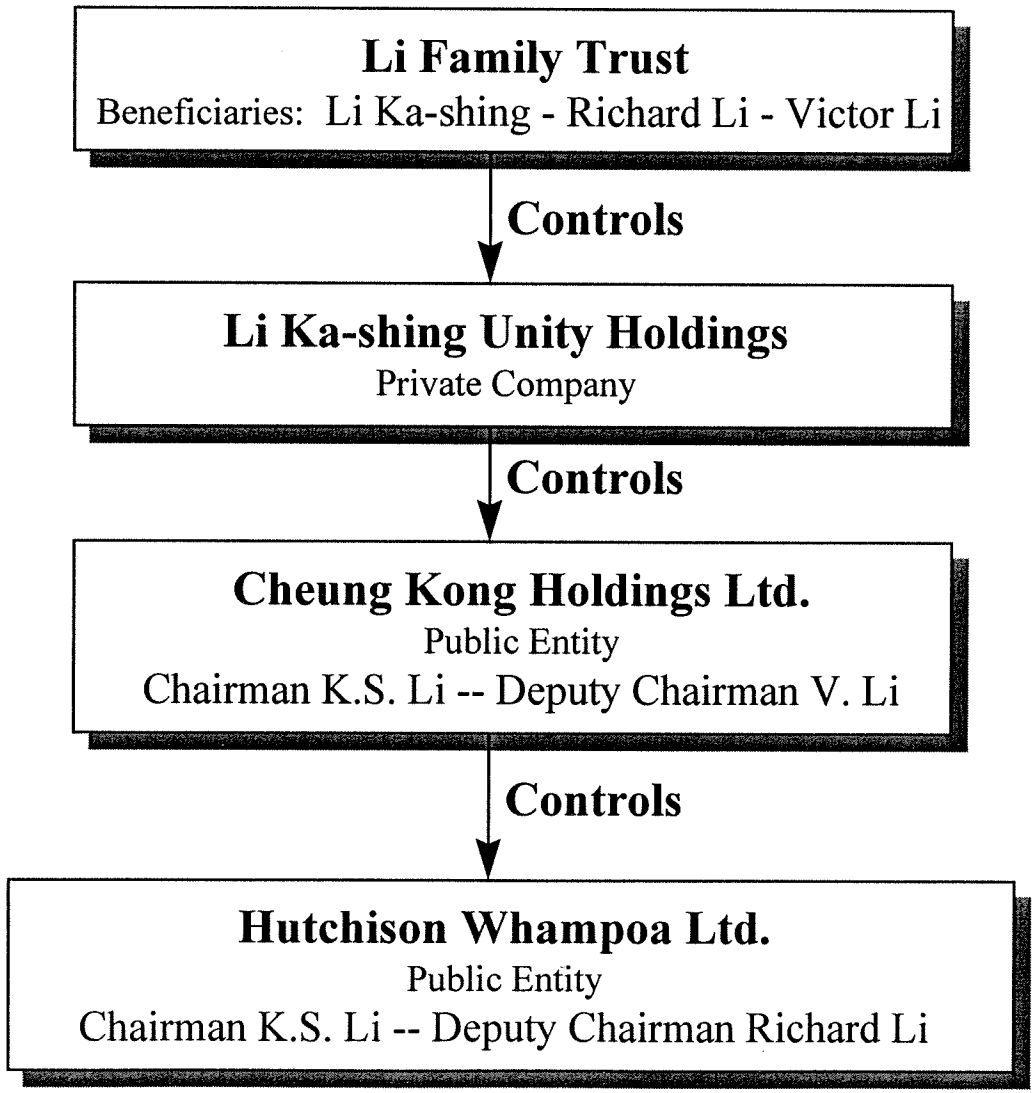
(e) Not applicable.

(f) Not applicable.

(g) Not applicable.

ANNEX 1


Richard Li
Principal Shareholder
Deputy Chairman
Chairman
Hutchison Whampoa Ltd.
Subsidiaries & Associates
Total employees 55,741
Pacific Century Group
Private Companies
2,707 employees & agents
RETAIL
16,383 employees
PORTS
10,219 employees
ENERGY
4,010 employees
TELECOM
13,798 employees
PROPERTIES
2,857 employees
HOTELS
897 employees
OTHERS
7,577 employees
Media & Technology
13 employees
Financial Services
200 employees
Property Investments
9 employees
Pacific Century Regional Developments
Public Company (Singapore)
61 employees
INSURANCE
2,351 employees & agents


Li Family Trust
Beneficiaries: Li Ka-shing - Richard Li - Victor Li
Controls
Li Ka-shing Unity Holdings
Private Company
Controls
Cheung Kong Holdings Ltd.
Public Entity
Chairman K.S. Li -- Deputy Chairman V. Li
Controls
Hutchison Whampoa Ltd.
Public Entity
Chairman K.S. Li -- Deputy Chairman Richard Li

CHEUNG KONG (HOLDINGS) LIMITED

Cheung Kong (Holdings) Limited (CKH) is an investment holding company with activities in property development and project management. It is controlled by the family of Li Ka-shing through a trust which holds 33.58% of the shares. As of December 31, 196 Cheung Kong had revenue of US$1.7 billion and a net profit after tax of US$1.8 billion, including subsidiary profits. The market capitalization of the CKH on November 4, 1997 was approximately US$18 billion.

HUTCHISON WHAMPOA LIMITED

Hutchison Whampoa Limited is a Hong Kong-based, diversified corporation. Its core businesses include: property development, investment and management of container ports, retail, telecommunications and energy. The Li Family Trust and Cheung Kong own nearly 50% of Hutchison Whampoa shares. As of December 31, 1996, Hutchison Whampoa's revenue was US$4.73 billion. Its net profit after tax was US$1.55 billion. The market capitalization of the Hutchison Group on November 4, 1997 was approximately US$30 billion.

HUSKY OIL

Husky Oil is an internationally active petroleum company whose two major shareholders are the Li Family and Hutchison Whampoa who own 46% and 49% respectively. Calgary-based, it is engaged in exploration, development, production, purchasing, transportation, refining and marketing of crude oil, natural gas, natural gas liquid and refined products. As of December 31, 1996, Husky Oil's revenue was US$930.4 million. It has a total of 1,400 employees, primarily based in Canada.

HONGKONG ELECTRIC HOLDINGS LIMITED

Hongkong Electric Holdings Limited (HEH), the listed company of the Hongkong Electric Group of companies, is a member of the Cheung Kong Group and is controlled by the family of Li Ka-shing through a trust which holds 34.62% of the issued share capital of the company. The Hongkong Electric Company is an electricity utility first established in January 1889 and supplies electricity to customers on Hong Kong Island and Lamma Island. As of December 31, 1996, HEH had revenue of US$991 million and net profit after tax of US$536 million. The market capitalization of HEH on November 4, 1997 was approximately US$7.3 billion.

ORANGE PLC

Orange Plc operates the fastest growing digital PCS network in the United Kingdom. It was launched in April 1994 by Hutchison Whampoa which retains a 49.02% stake in the company following Orange Plc going public in the first quarter of 1996. In just over three years Orange has gained 1.1 million customers and has built a 13.3% share of the total established mobile phone market. It covers 95% of the U.K. population. As of December 31, 1996 orange Plc had revenue of US$1.04 billion. The market capitalization of Orange Plc, as of November 4, 1997, was US$4.6 billion.

THE PACIFIC CENTURY GROUP

The Pacific Century Group was established in October 1993 by Richard Li, the group's chairman and Chief Executive. It is wholly-owned by Mr. Li and the company's management who founded STAR TV, the first pan-Asian satellite television network, in 1990. The STAR TV network developed an audited audience of 50 million subscriber homes in the first 36 months on the air, an average of 46,000 new subscriber households per day for three years. Today STAR TV is viewed by more than 220 million viewers in 63 countries. In 1993 Mr. Li negotiated the sale of 63.3% STAR TV to News Corp. for US$525 million. In 1995 he completed the sale of the remaining 36.4% interest in the network to News Corp. for US$125 million. The Pacific Century Group was initially funded with the profits from the sale of STAR TV. The group's primary businesses are focused on digital technology and media, financial services, infrastructure and property development.

AFFIDAVIT

I, George Chan, do hereby swear, under penalty of perjury, that:

1. I am Executive Vice President of Pacific Century Group, Inc., and I have personal knowledge of the matters hereinafter referred to, and make this affidavit in support of the Letter of Intent filed by Pacific Century Group, Inc. in the Federal Communications Commission's Ka-band second processing round.

2. the financial information contained in the Letter of Intent is true and accurate to the best of my knowledge and belief.

George Chan

Dated: December 22, 1997

ATTACHMENT C

PCG USA Ka-Band Satellite Network

TABLE OF CONTENTS

Table of Figures

Table of Tables

1 - INTRODUCTION

During the course of the next few years Pacific Century Group ("PCG") will establish a global network, using geostationary satellites operating in Ka- and X- band frequencies to service the digital communications market. As part of this development, PCG proposes to establish a geostationary Ka- and X-band satellite network to service the North, Central, South American and Caribbean parts of this market. The portion of the network described herein is designed to provide services to the USA market at Ka-band only.

The space segment part of this network is being designed and built under filings first submitted to the International Telecommunication Union ("ITU") in 1994, and fully published (Request for Coordination) on various dates from the end of 1996 through to the middle of 1997. The list of SamSat series filings is given in Annex 1. The coordination status of these networks is given in Annex 2.

2 - NETWORK DESCRIPTION

2.1 - General

Many digital services, such as internet, training videos, home shopping, etc., are characterized by their asymmetrical information flow requirements, in that the forward path information flow rates and volumes (information source to end user) greatly exceed those of the return path (end user to information source). PCG's global Ka- and X-band network has been specifically designed to meet this asymmetrical information flow requirement. The forward paths are provided by PCG's high speed, wide band, satellite links, whereas the return paths are provided either by low speed, narrow band, satellite links using existing C- or Ku-band satellites, or via low speed public or private, terrestrial telephone or data links. This architecture enables the satellite's capacity to be fully assigned to the forward, data delivery function, providing significant efficiencies in capacity utilization, with attendant economies in operating costs.

2.2 - Uplink

The baseline network is illustrated in Figure 2.2-1. Each co-located satellite will be fed with two uplink carriers, each operating at 250 Mbps, from at least three separate uplink locations: a total of at least six carriers per satellite. The resulting aggregate uplink data rate is at least 3 Gbps. Any uplink carrier can be routed, under satellite ground control, to any one, or any number, of downlink beams. The baseline configuration with 3 uplink beams from 89°W position is shown in Figure 2.2-2.

The information to be transmitted is gathered and groomed both centrally, at a PCG information-processing center, and locally at each uplink station, as illustrated in Figure 2.2-1. In this architecture, the centrally processed footprint-wide information is distributed, on broadband terrestrial or satellite links, to each Ka-band uplink location. There, regional and local information is gathered and groomed, and multiplexed with the footprint-wide information into the appropriate uplink carrier.

Other architectures are possible, including some which economize on the terrestrial trunking requirements, according to the location of information sources, and the proportion of downlink, footprint-wide, broadcast information. Precise locations for uplinks have not been chosen. PCG will seek specific authority for those uplink earth stations to be located in the USA when precise sites are chosen. Uplinks outside of the USA are likely, if used, to be in British Dependent Territories or in other jurisdictions covered by the WTO Basic Telecom Agreement.

In order to contain the uplink inter-beam interference to acceptable levels, the uplink beams will have a minimum beam centre separation of approximately 800 Km.

Uplink rain fade compensation may also call for uplink site diversity in some cases. Separation will depend on characteristic rain cell sizes for different regions but typically will be in the range of 50 Km to 100 Km.

Uplink power control will also be employed to compensate for uplink rain fades, while containing interference to adjacent satellite to acceptable levels.

2.3 - Downlink

The satellite downlink is a structure of approximately 50 contiguous spot beams. Each spot will support an information rate of approximately 500 Mbps. Two collocated satellites in the 12 Kw to 15 Kw class are required. Each satellite contributes 250 Mbps to each spot, operating in opposite polarizations. The USA coverage is shown in Figure 2.3-1. Spot beams with -3 dB contours are shown. The aggregate downlink throughput is approximately 25 Gbps.

Data multiplexing on the ground will determine the information content of each uplink carrier. This arrangement permits considerable flexibility in determining the information content of each downlink spot, according to selection criteria which can take account of such factors as time zones, state boundaries, local and geographic differences, etc.

Figure 2.3-2 illustrates the principle by showing a possible information content type for each carrier.

2.4 - End to End Performance

The satellite links are designed to provide superior performance with a BER better than 10^{-10} for 99.7% of an average year.

2.5 - Subscriber Terminals

Subscriber terminals will be receive-only. Each will consist of an outdoor unit comprising a 65 cm. Antenna RF package, connected at an IF frequency to the indoor unit providing the baseband demodulation, decoding and demultiplexing functions, plus the physical/electrical interface to the end user's terminal devices as appropriate.

2.6 - TT&C

To ensure good link margins from a range of possible TT&C locations in different rain zones, the TT&C r.f. link will operate in C band, using linear polarisation. The satellite will be constructed with both omni-directional and directional antennas for launch/emergency operation and for normal operation respectively. As the satellite is registered under the UK Administration, the major part of the TT&C ground segment will be located in the UK, or in a British Dependant Territory. To ensure the highest possible reliability, all parts of the TT&C system will be fully redundant, or have suitable back up and standby facilities.

3 - TECHNICAL INFORMATION

3.1 - Orbital Locations

PCG have filed with the ITU for Ka- and X-band networks at 89°W, 82°W and 75°W to serve the North and South American continents, the Caribbean and to provide European connectivity. These positions were chosen because of their favorable viewing angles and good ITU coordination prospects. With respect to this latter point, at the time that the ITU Advanced Publication Information and Request for Coordination submissions were made – Advanced Publication Information was received by the ITU on 27 February 1995 and the Request for Coordination received by the ITU on 27th August 1995 - there were no other existing or planned commercial Ka-band satellite networks within 10 degrees of these positions.

The locations at 89°W and 82°W have been selected as the prime positions for the USA service because their viewing angles are better than those for the 75°W location. 89°W will be used for the first network with a start of service in the year 2001, subject to the timely receipt of FCC authorization, with 82°W being used for the follow-on network expansion within two years later[1]. The 75°W location will be used to serve Central and South America, and to provide European connectivity. It will not be used for U.S. service.

The elevation contours from the prime orbit location of 89°W and 82°W are shown in Figure 3.1-1 and Figures 3.1-2 respectively.

The satellite positions will be maintained within +/- 0.1 degree of longitude and latitude of their nominal positions.

3.2 - Satellite Coverage

The network uses two co-located satellites in each orbital location, identical except that they operate with opposite circular polarization. The downlink coverage of each satellite, composed of

[1] PCG's deployment schedule comports with the requirements of Section 25.145(f) regarding implementation milestones for Ka-band FSS systems (see Section 4.2). Section 25.145 will come into effect during the review of this and other LOIs and applications filed by December 22, 1997 pursuant to the FCC Public Notice of October 15, 1997. PCG requests any wavier necessary in order to maintain the proposed milestone and launch schedule.

approximately 50 contiguous fixed spot beams, each of approximately 0.7° beam width, is the whole of CONUS, as illustrated in Figure 2.3-1. The pattern of a typical beam is shown in Figure 3.2-1. As each satellite provides complete coverage of CONUS, they can be launched sequentially. The second satellite will be launched within one year after the first. Co-location will provide a measure of service security in that the service can continue to be provided, albeit at single satellite capacity, in the event of an in-orbit satellite failure.

3.3 - Frequency and Polarization Plan

3.3.1 - Frequency

The network uses uplink and downlink frequencies in the Fixed Satellite Service (FSS) Ka-Band. For uplink stations located in the USA, the uplink and downlink frequencies will be assigned within the following ranges, where FSS/GSO has primary or co-primary allocations in the USA:

Earth-to-Satellite	:	28.35 - 28.6 GHz & 29.25 - 30.0 GHz
Satellite-to-Earth	:	17.7 - 18.8 GHz & 19.7 - 20.2 GHz

PCG understands that in the USA, FSS has the status of co-primary with respect to terrestrial services in the band of 17.7 - 18.8 GHz, and GSO/MSS in the band of 29.25 - 29.5 GHz, and will take this into account in the final selection of the specific operating bands.

3.3.2 - Polarisation

Polarization for the traffic paths will be circular. The downlink polarisation for each satellite will be orthogonal to that of its uplink. The uplink and downlink polarisation of the second satellite will be opposite to those of the first satellite.

3.4 - Frequency Re-Use and System Capacity

Frequency re-use is achieved by spatial separation of spot beams operating on the same frequency. Also, co-located satellites operate on opposite polarization. Therefore, the overall scheme is a combination of spatial separation and dual orthogonal polarization, providing 25 times frequency re-use on the downlink from each orbital location.

The baseline, 4 cell, downlink frequency re-use pattern is shown in Figure 3.4 -1. Figure 3.4-2 shows one case of the co-frequency spot beam gain contours (at -2, -4, -6, -8, -10, -15 and -20 dB for the multiple contour beam and -3 dB for the other beams). The gain pattern of the multiple contour beam represents the idealized case. Some margins are needed to take account of issues related to implementation of multi-horn feed and are reflected in the link budget calculation.

Under this scheme, a total of approximately 700 MHz bandwidth is used for each cell, 350 MHz in each polarization. Satellite A uses one polarization and satellite B uses the other opposite polarization. No adjacent cells use the same frequencies.

Each satellite has approximately 50 spot beams on the downlink, each supporting a data rate of approximately 250 Mbps, providing a 2-satellite aggregate of approximately 25 Gbps.

Other frequency reuse schemes are available, each with its advantages and disadvantages. For example a 3-cell scheme is possible and is being closely studied. PCG would like to reserve the right to offer this as an alternative, under the condition of continued compliance with the FCC assigned frequency bands, noted above, and the coordinated power limits.

As previously noted, there will be at least 3 uplink beams for each satellite. Frequency re-use with acceptable intra-system interference is achieved by separating each from the other by an adequate distance, and by using dual circular polarization in each beam.

3.5 - Transmission Schemes and Emission Designators

At least six 250 Mbps carriers, at two carriers per uplink earth station, are transmitted to each satellite. With appropriate on-board routing matrixes, implemented either at RF or IF band for the baseline bent-pipe payload, or at base band for the optional On Board Processor (OBP) payload, the carriers will be routed to different downlink beams. For the bent-pipe design the information grooming and multiplexing, to determine the content of each carrier, is performed on the ground. For the OBP design, the same task would be shared between the ground and the OBP.

The carrier transmission format in this baseline design is DVB, which uses QPSK modulation and, for FEC, a concatenation of 1/2 rate convolution and (204,188) Reed-Solomon codes. An inter-leaving depth of 12 is used between the convolution and RS codes in order to improve the coding performance. Other carrier transmission formats are under active study and may also be used.

The traffic carrier emission designators are given in Table 3.5-1.

Signal	Designator
Communication Carriers	250MG1W

Table 3.5-1 - Traffic Carrier Emission Designators

3.6 - Spacecraft Description

3.6.1 - Payload

Two types of satellite payloads are considered: the baseline "bent-pipe" type and an optional "On Board Processing" (OBP) type. The block schematic for both types can be represented by Figure 3.6-1.

For the baseline design, the routing matrix will consist of transparent RF and/or IF switches. There is no demodulation. Hence, there is no information interchange between the carriers. Individual uplink carriers will be routed to any one or any number of downlink beams, under network ground control, with the routing commands being transmitted via the command carrier.

Under the optional OBP case, the spacecraft communication subsystem is nearly identical, except that the routing matrix function is more versatile, being performed at base band by the OBP. This permits the information content of any downlink carrier to be compiled from elements of various uplink carriers. Thus the burden of information grooming and routing is shared between the ground and the OBP, and the information content of every downlink beam can be different, if required.

Satellites with OBP payloads are being closely studied due to their superior routing capability, downlink content flexibility and economies in the ground system information grooming subsystem. PCG wishes to reserve the right to deploy such an OBP-based payload, provided that they continue to comply with the above noted FCC frequency assignments and coordinated power limits.

As the downlink coverage spans a number of different rain zones, downlink rain attenuation across the coverage area varies widely. To provide near identical end-to-end service availability across the footprint, throughout the whole year, a different power level would be needed in each downlink spot beam according to its position with respect to rain zones. As it is not practical to exactly tailor the power levels, the TWTA's are grouped in several power bands, such that the year round, worst case, end-to-end availability is achieved in every spot.

3.6.2 - Mass Budget

The mass budget is given in Table 3.6.2-1.

Payload	500 Kg
Bus	1300 Kg
Spacecraft Subtotal	1800 Kg
Margin	90
Total (Dry Mass)	1890 Kg
Total with Propellant	4000 Kg (15 year life)

Table 3.6.2-1 Mass Budget

3.6.3 - Power Budget

The mass budget is given in Table 3.6.3-1.

Payload	12 Kw
Bus	800 W
Spacecraft Subtotal	12.8 Kw
Margin	600 W
Total	13.4 Kw

Table 3.6.3-1 Power Budget

3.7 - Link Budgets

For the types of services targeted, employing small diameter receiving antennas, the overall link performance is heavily dominated by the downlink performance. As a first approach, we choose to treat separately the uplink and the downlink in the link budget calculation. A margin of 0.3 dB is reserved in the downlink budget to take account of the uplink degradation. A separate uplink calculation is attached to justify this approach.

The targeted link availability is 99.7% of an average year within the service area.

3.7.1 - Downlink

In this link analysis, the ITU rain model and calculation methods are used. Link budgets are performed for each of the major rain zone, N, M, K, E, D, B. The results are shown in Table 3.7.1-1.

In order to conserve onboard power, the satellite EIRP levels are chosen to suit each rain zone. The calculated results are shown in Table 3.7.1-2 (a) to Table 3.7.1-2 (d).

Rain Zone N	Beam Peak	Beam Edge (-3 dB)
TWTA Output Power	280W	280W
Post TWTA losses	1.5 dB	1.5 dB
Satellite Tx Antenna Gain	47.8 dBi	43.5 dBi
EIRP	70.8 dBW	66.5 dBW

Table 3.7.1 -2 (a) - TWTA Size and EIRP for spot beams covering Rain Zone N.

Rain Zone M	Beam Peak	Beam Edge (-3 dB)
TWTA Output Power	180W	180W
Post TWTA losses	1.5 dB	1.5 dB
Satellite Tx Antenna Gain	47.8 dBi	43.5 dBi
EIRP	68.8 dBW	64.6 dBW

Table 3.7.1 -2 (b) - TWTA Size and EIRP for spot beams covering Rain Zone M.

Rain Zone K	Beam Peak	Beam Edge (-3 dB)
TWTA Output Power	130W	130W
Post TWTA losses	1.5 dB	1.5 dB
Satellite Tx Antenna Gain	47.8 dBi	43.5 dBi
EIRP	67.4 dBW	63.1 dBW

Table 3.7.1 -2 (c) - TWTA Size and EIRP for spot beams covering Rain Zone K.

Other rain zones	Beam Peak	Beam Edge (-3 dB)
TWTA Output Power	70W	70W
Post TWTA losses	1.5 dB	1.5 dB
Satellite Tx Antenna Gain	47.8 dBi	43.5 dBi
EIRP	64.8 dBW	60.5 dBW

Table 3.7.1 -2 (d) - TWTA Size and EIRP for spot beams covering Rain Zones other than N, M and K.

The characteristics of ground terminals are shown in Table 3.7.1-3.

Antenna Size	65 cm
Frequency	19.95 GHz
Gain	41.1 dBi
Clear Sky system Noise Temperature	240 K
G/T	17.3 dB/K

Table 3.7.1-3 Ka-Band Ground Terminal Parameters

3.7.2 - Uplink

The link budget calculation results are shown in Table 3.7.2-1. The assumed characteristics of satellite receive system are shown in Table 3.7.2-2. Margins are included for antenna gain at the beam edge.

A 7-meter uplink earth stations antenna with 200W TWT HPA is used, offering over 13 dB of link margin. This will permit normal operation at around 20W with a 10dB range of uplink power control. Higher power levels and larger antennas are also being considered and can be deployed to increase the uplink power control range, if it is subsequently found necessary. Site diversity is also planned, where necessary, to practically eliminate uplink performance degradations.

Satellite Parameter	Beam Peak	Beam Edge (-3 dB)
Satellite Receive Gain	44.8 dBi	41.2 dBi
Receive system Noise Temperature	600 K	600 K
G/T	17 dB/K	13.4 dB/K

Table 3.7.2-2 Satellite Receive Parameters

3.8 - Power Flux Density Analysis

The maximum power flux density on the surface of the Earth is calculated and shown in Table 3.8-1.

Area	Rain Zone N	Rain Zone M	Rain Zone K	Other zones
Power Flux density on the Earth surface	-116.7 $dBW/m^2/MHz$	-118.7 $dBW/m^2/MHz$	-120.1 $dBW/m^2/MHz$	-122.7 $dBW/m^2/MHz$

Table 3.8-1 Maximum Power Flux Density on the Earth Surface.

The PFD limits on the Earth surface are met for all rain zones.

3.9 - Interference Analysis

3.9.1 - Intra-System Interference

The intra-system interference is mainly due to extensive frequency re-use. Interference to any given carrier arises from:

a) Co-frequency, co-polarization carriers of the adjacent beams of the same satellite;
b) Co-frequency, orthogonal polarization carriers of the same beam of the co-located satellite;
c) Co-frequency, orthogonal polarization carriers of the adjacent beams of the co-located satellite;

Trade-off between the antenna on-axis gain, gain at the -3 dB contour and the required beam isolations may be needed.

The interference situation on the uplink is not the same as that on the downlink due to their different frequency re-use scheme. In both uplink and downlink, this interference noise is lower than the thermal noise.

3.9.2 - Adjacent Satellite

The PCG Satellite System can be operated in a 2 degrees spacing environment as required by the FCC. The following provides the analysis of interference between two homogeneous satellites, with the assumption of similar operating parameters for interfering and interfered-with satellite networks.

3.9.2.1 - Uplink

Assumptions:

- Similar transmit e.i.r.p. density is assumed for earth stations of both systems.
- Uplink power control is assumed for both systems.
- Transmit antenna of 2.4 M is assumed with the on-axis gain of 55.5 dBi.
- The side lobe pattern is assumed to be $G(\theta) = 29 - 25\log\theta$ dBi.

C/I = Go - G(2) = 55.5 - 21.5 = 34 dB.

The aggregate interference from 2 adjacent satellites will result in an aggregate C/I of 31 dB. As the overall required C/N+I is 4.1 dB for the baseline configuration, the interference is substantially less than 20%.

3.9.2.2 - DownLink

Assumptions :

- Similar satellite transmit e.i.r.p. density is assumed for satellites of both systems
- Uplink power control is assumed for both systems.
- Receive antenna of 65 cm is assumed with the on-axis gain of 41.1 dBi.
- The side lobe pattern is assumed to be $G(\theta) = 29 - 25\log\theta$ dBi.

C/I = Go - G(2) = 41.1 - 21.5 = 19.6 dB.

The aggregate interference from 2 adjacent satellites will result in an aggregate C/I of 16.6 dB. The interference is less than 20%.

3.10 - Telemetry, Tracking and Command

3.10.1 - Ground Facilities

In fulfillment of their obligations under the ITU Treaty, the UK Administration requires that the TT&C ground facility, for all UK registered satellites, must be located in the UK, or in a British Dependant Territory (BDT). As neither the 89°W nor 82°W locations have direct line of sight with the UK, the UK Administration has agreed that the facility can be split into 2 parts, namely the Satellite Control Centre (SCC) and the TT&C earth station. The TT&C earth station could be located in a foreign country such as the USA. The TT&C earth station would interface with the satellite via the chosen r.f. carriers as detailed below, and with the SCC via redundant, dedicated data links. Locations for the TT&C earth stations have not yet been chosen.

Under normal operational conditions all satellite control and monitoring functions will be undertaken from the SCC, with the TT&C earth station operating in a hands-off, remote control, mode. Under emergency conditions, such as loss of redundant data links or major SCC failure, complete satellite control and monitoring will be undertaken from the TT&C earth station. Under such

emergency conditions, PCG will ensure, either by manning with their own staff, or by contract arrangement, that fully trained staff are immediately available to take over the emergency control and monitoring operation.

3.10.2 - Satellite TT&C Subsystem

The satellite TT & C subsystem electronics will be fully redundant. Normal mission operation will use a directional antenna providing adequate link margin in both the uplink and downlink. During launch and satellite emergency operation a low gain omnidirectional antenna will be used. The maximum power levels for the uplink (command) and downlink (telemetry) carriers are given in the ITU Request for Coordination Submission, and will be finalized through coordination.

3.10.3 - RF Frequencies and Polarization.

Linear polarization will be used for uplink command and downlink telemetry carriers.

Command and telemetry carriers will operate at C-band. The frequency ranges will be as follows:

Command : 5850 - 5870 MHz; 5925 - 5945 MHz; 6405 - 6425 MHz; 6705 - 6725 MHz
Telemetry : 3400 - 3420 MHz; 3680 - 3700 MHz; 3700 - 3720 MHz; 4180 - 4200 MHz

The exact frequencies will be chosen within the above bands as a result of coordination.

3.10.4 - Emission Types

The command carrier uses FM and the telemetry carrier uses PCM/PSK modulation. The emission designators are given in Table 3.10.4-1.

Carrier	Designator
Telecommand Carrier	2M50FXD
Telemetry Carrier	100KGXD

Table 3.10.4-1 - TT&C Emission Designators

4 - IMPLEMENTATION

4.1 - Suppliers

PCG will award contracts for space and ground segments upon the grant of appropriate FCC approval. Detailed technical and contractual discussions have been held, and are continuing, with a number of space and ground segment manufacturers. These manufacturers are located in the USA,

Europe , Japan, and elsewhere. These discussions have established, beyond doubt, the technical feasibility of the satellite design. PCG is in a position to move quickly to conclude contracts, at the right time, with a number of suppliers.

As PCG is planning a global network, four satellites and ground segments will be purchased over the next few years, as laid out below for the USA market, and at least the same number for service to other parts of the world.

PCG is also seeking licenses and landing rights in a number of countries in pursuit of their global deployment plan. It is inevitable that the time sequence of the granting of such market access rights will have a major influence on the choice of suppliers for both space and ground components of the network.

4.2 - Deployment Plan

On the assumption that it will take the FCC six months to grant authorization, PCG's deployment plan is as follows:

Milestone	FCC Time	Suggested Dates [1]
FCC Grant	0	Mid 1998
Start Construction (Award Contract) Satellite 1& 2	0 + 12	Mid 1999
Start Construction (Award Contract) Satellite 3 & 4	0 + 24	Mid 2000
Launch Satellite 1 @ 89°W	0 + 36	Mid 2001
Launch Satellite 2 @ 89°W	0 + 48	Mid 2002
Launch Satellite 3 @ 82°W	0 + 60	Mid 2003
Launch Satellite 4 @ 82°W	0 + 72	Mid 2004

[1]Subject to change based on any delays in FCC authorization process.

4.3 - Launch vehicle

The estimated satellite mass and volume will be compatible with various existing launch vehicles and launch vehicles to be available in the near future. Similarly, the selection of launch vehicle may be influenced by the time sequence of the grant of market access.

4.4 - Estimated Costs

4.3.1 - Capital Costs

System	Satellite 1 at 89°W	Satellite 2 at 89°W	Satellite 1 at 82°W	Satellite 2 at 82°W
	US$M	US$M	US$M	US$M
Satellite	160	140	130	130
TT&C	15	10	15	10
Launch Service	110	110	110	110
Insurance	57	52	51	50
	342	312	306	300

4.3.2 - Operating Cost

First Year Operating Cost	US$M
Staff	5.0
Office Accommodation	1.0
Travel Accommodation	1.5
Marketing and Promotion	3.0
Agency Commission	1.0
Other Expenses	1.0
Total US$M	12.5

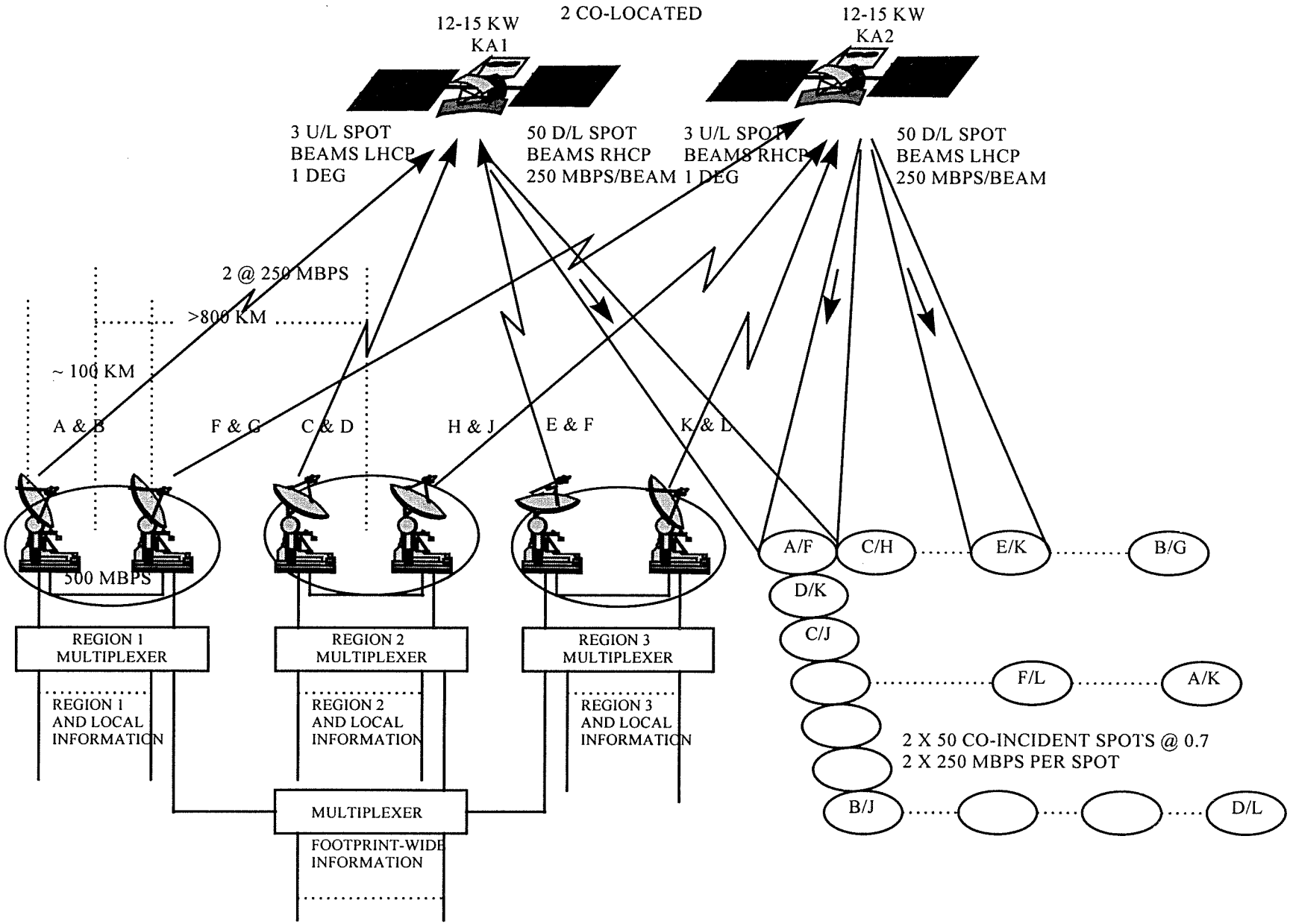


Figure 2.2 - 1 USA Ka -Band System Layout

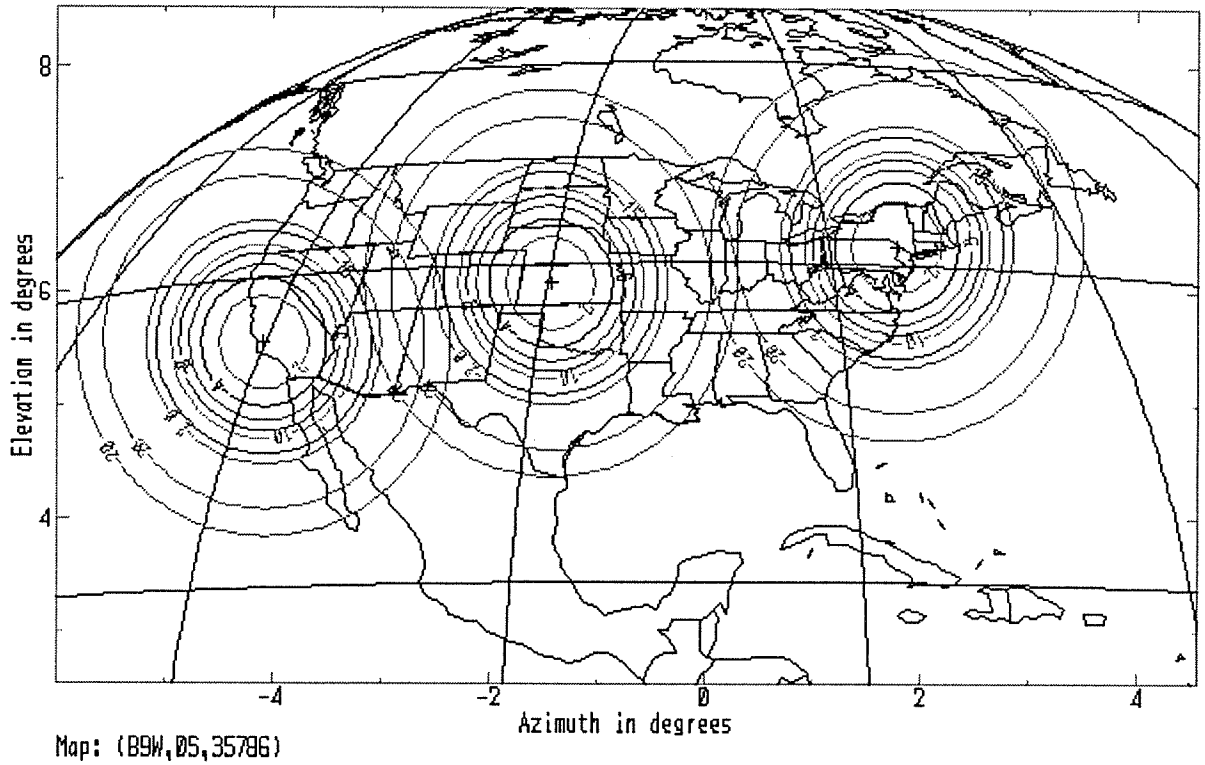


Figure 2.2-2 Example of 3 uplink beams coverage (from 89 degrees West Position).

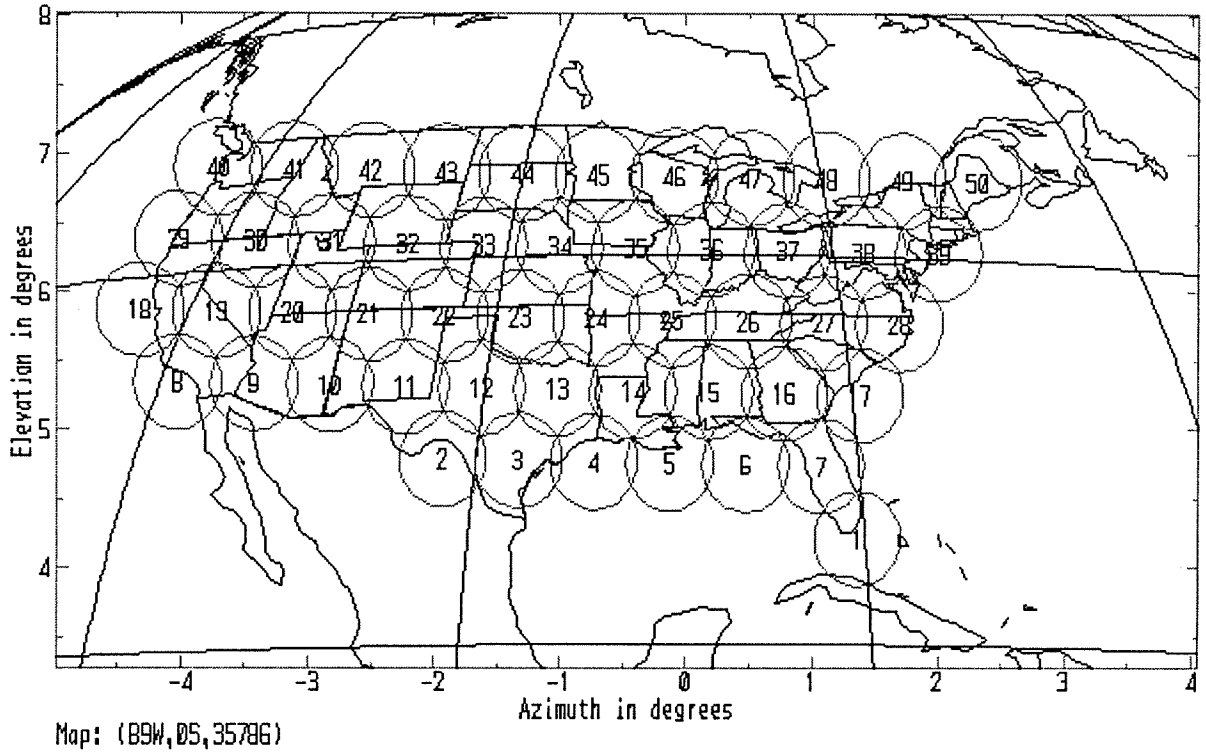


Figure 2.3-1. Downlink Coverage of the PCG Ka1 and Ka2 satellites (from 89 degrees West position).

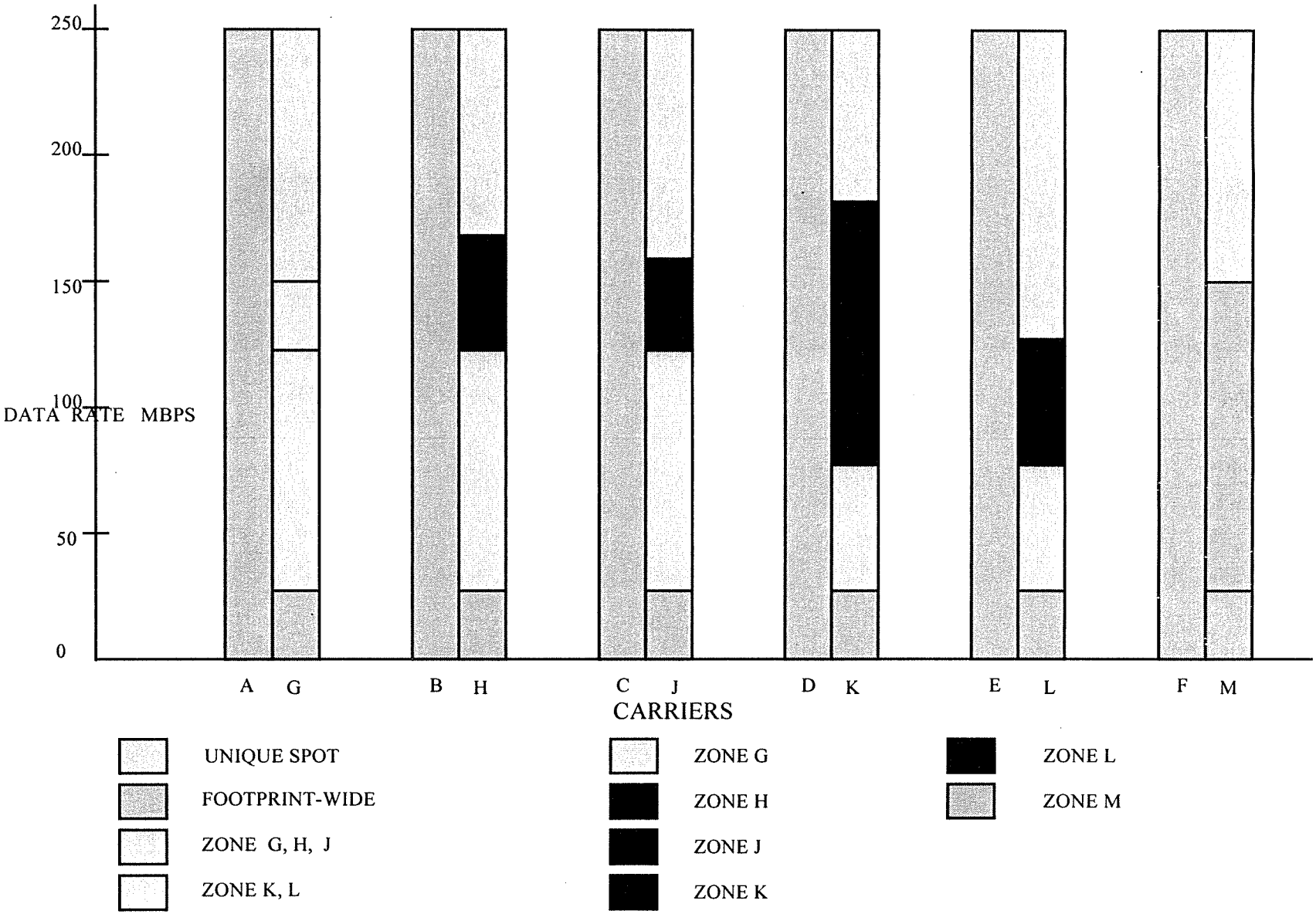


Figure 2.3-2 PCG Ka-Band Carrier - Data Assignment

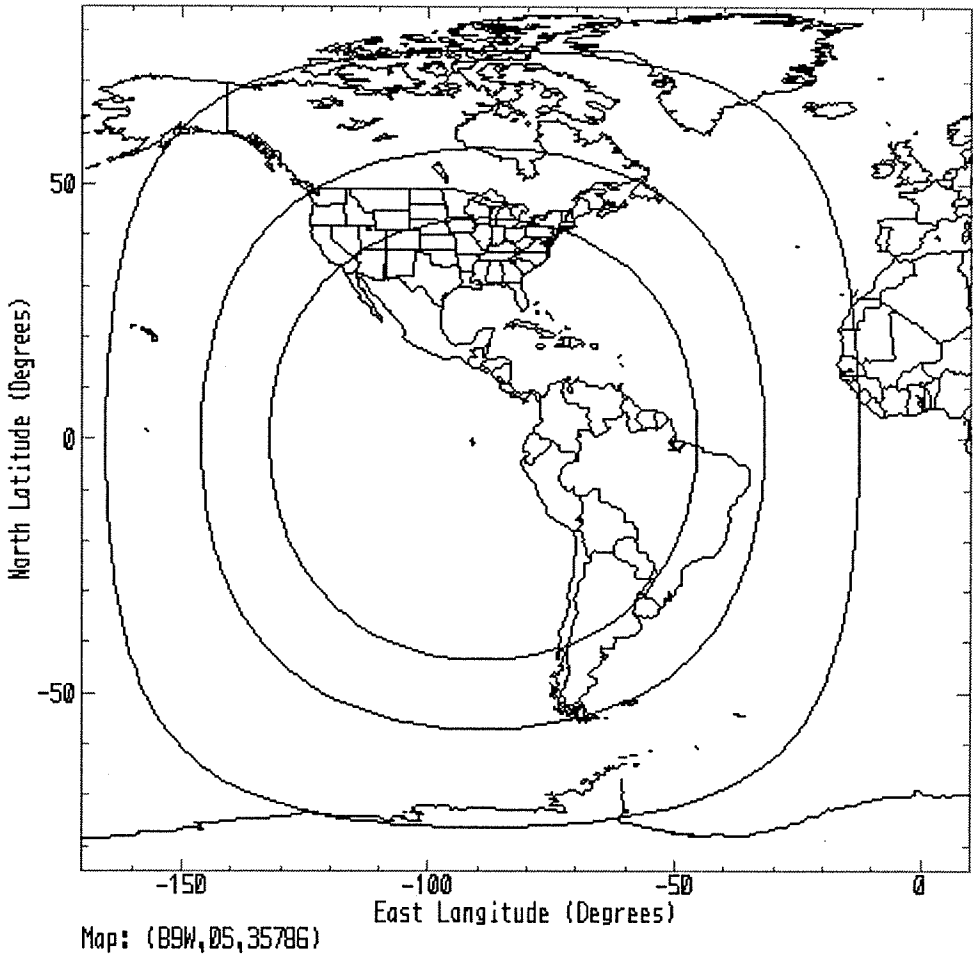


Figure 3.1 - 1. View Angles from 89 degrees West (contours of 5°, 25° and 40° elevation angle)

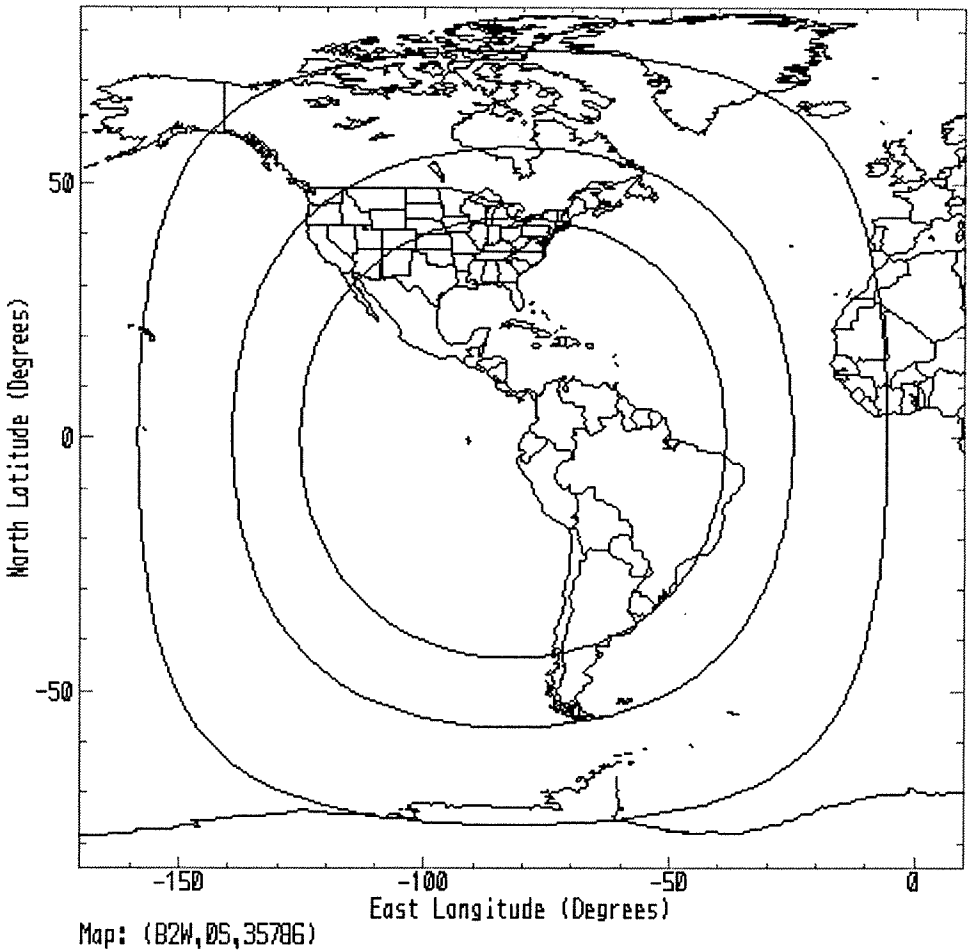


Figure 3.1 - 2. View Angles from 82 degrees West (contours of 5°, 25° and 40° elevation angle)

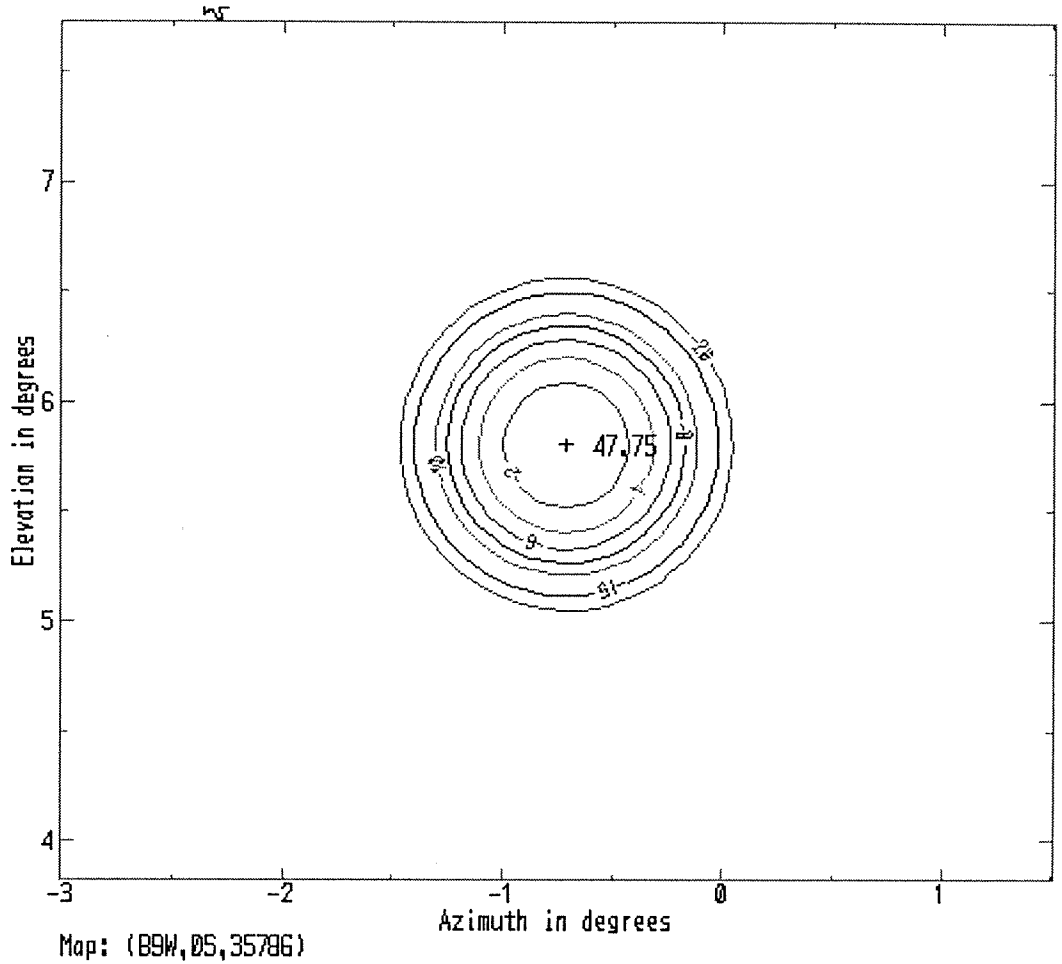


Figure 3.2 -1 Gain Pattern of a Spot Beam of 0.7°.

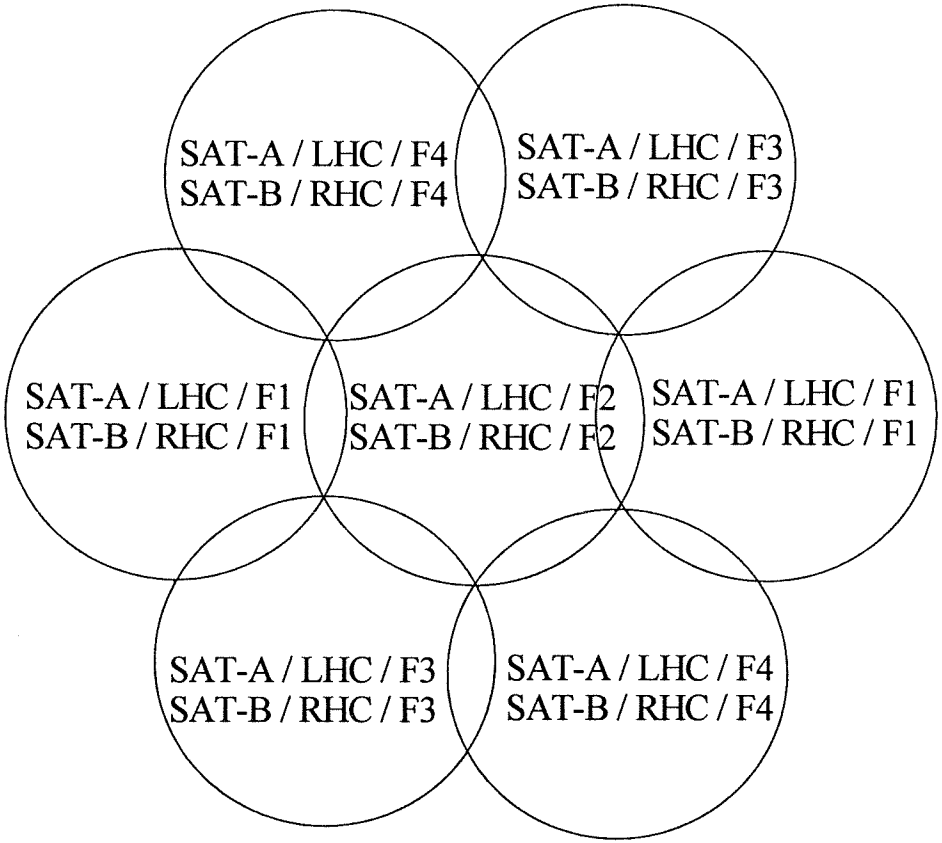


Figure 3.4 -1. Downlink Frequency Re-Use Pattern

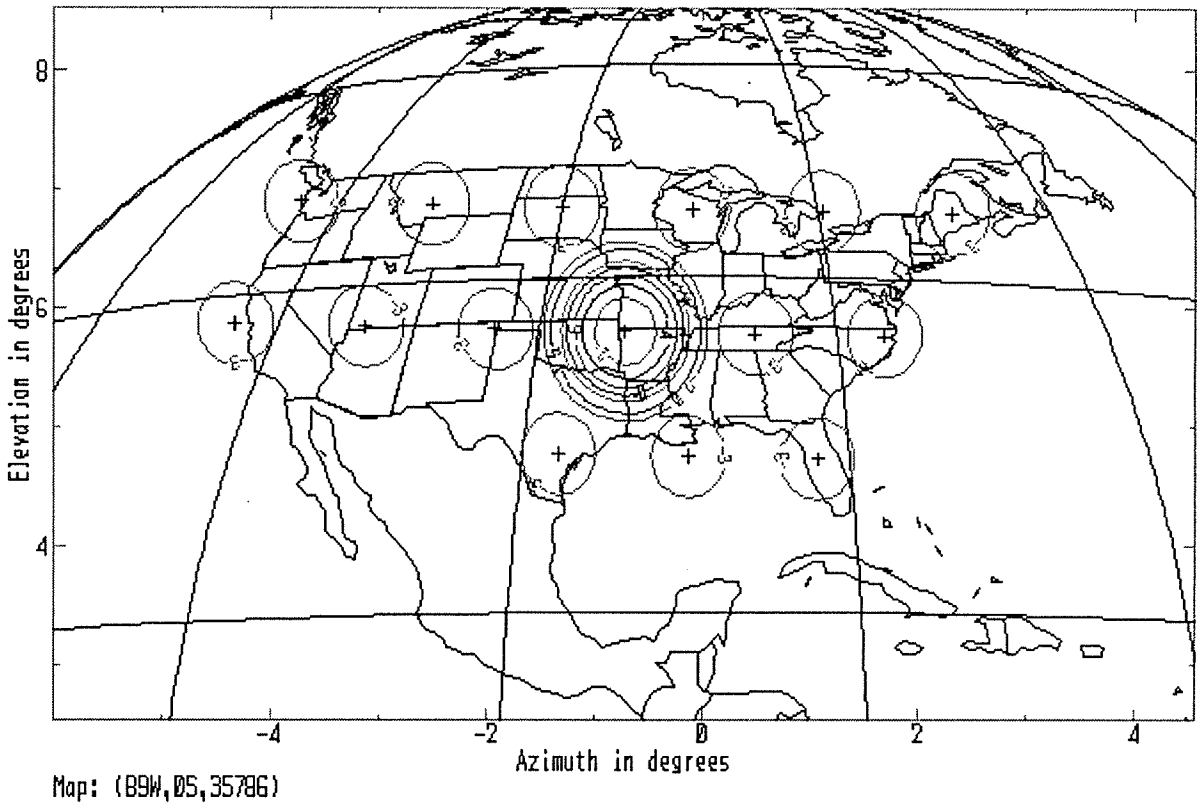


Figure 3.4-2 Co-frequency spot beam gain contours
(-2, -4, -6, -8, -10, -15 and -20 dB for the multiple contour beam and -3 dB for the other beams)
(idealized gain pattern)

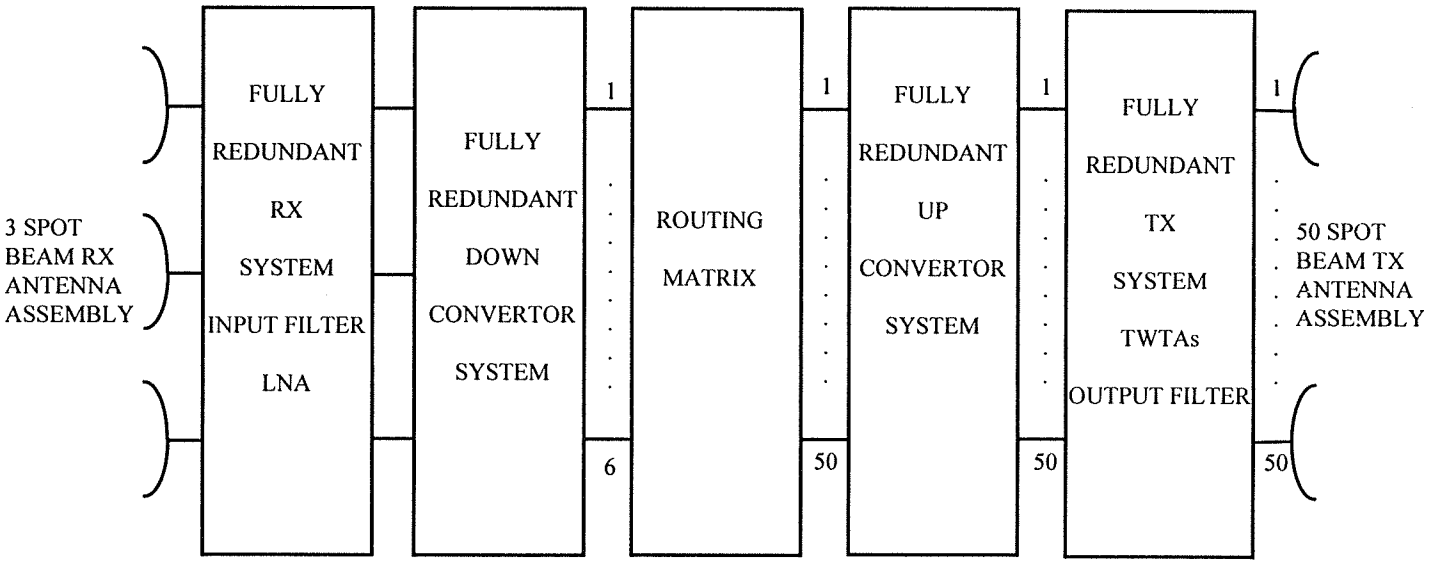


Figure 3.6-1 PCG Ka-Band Satellite Payload Schematic

Link Parameters	**Units**	**Clear Sky**	**Rain Zone B**	**Rain Zone D**	**Rain Zone E**	**Rain Zone K**	**Rain Zone M**	**Rain Zone N**
Ground Terminal Location		Beam Edge	Beam Edge	Beam Edge	Beam Edge	Beam Edge	Beam Edge	Beam Edge
Data rate	Mbps	250	250	250	250	250	250	250
FEC		0.5	0.5	0.5	0.5	0.5	0.5	0.5
Noise Bandwidth	MHz	347.234	347.234	347.234	347.234	347.234	347.234	347.234
Frequency	GHz	19.95	19.95	19.95	19.95	19.95	19.95	19.95
Transponder TWT size	Watts	48	70	70	70	130	180	280
Satellite Gain	dBi	43.5	43.5	43.5	43.5	43.5	43.5	43.5
Satellite EIRP	dBW	58.81	60.45	60.45	60.45	63.14	64.55	66.47
Elevation Angle	Degree	20	20	20	20	20	40	50
Range to Satellite	km	39554	39554	39554	39554	39554	37780	37078
Path Loss	dB	210.38	210.38	210.38	210.38	210.38	209.99	209.82
Atmospheric & Other Losses	dB	0.9	0.9	0.9	0.9	0.9	0.5	0.5
Availability		-	**99.90%**	**99.70%**	**99.70%**	**99.70%**	**99.70%**	**99.70%**
Rain Attenuation	dB	0	2.26	2.27	2.28	4.37	6.28	8.19
Ground Terminal Diameter	cm	65	65	65	65	65	65	65
Ground Terminal System Noise Temp	K	240	347.61	347.75	348.35	408.08	442.54	464.82
Ground Terminal Receive System G/T	dB/K	17.30	15.69	15.69	15.68	14.99	14.64	14.43
Ground Terminal Pointing Loss	dB	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Ground Terminal Received C/N	dB	7.52	5.29	5.28	5.26	5.17	5.12	5.08
Intra-System Interference C/I	dB	14.1	14.1	14.1	14.1	14.1	14.1	14.1
Inter-System Interference C/I	dB	21.6	21.6	21.6	21.6	21.6	21.6	21.6
Total Received C/(N+I)	dB	6.52	4.66	4.66	4.64	4.56	4.52	4.48
Required C/(N+I)	dB	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Margin	dB	2.42	0.56	0.56	0.54	0.46	0.42	0.38

Table 3.7.1 - 1 Ka-Band Link Budget (Downlink)

Link Parameters	Units	Clear Sky	Rain Zone B	Rain Zone D	Rain Zone E	Rain Zone K	Rain Zone M	Rain Zone N
Ground Terminal Location		Beam Edge	Beam Edge	Beam Edge	Beam Edge	Beam Edge	Beam Edge	Beam Edge
Data rate	Mbps	250	250	250	250	250	250	250
FEC		0.5	0.5	0.5	0.5	0.5	0.5	0.5
Noise bandwidth	MHz	347.234	347.234	347.234	347.234	347.234	347.234	347.234
Frequency	GHz	29.75	29.75	29.75	29.75	29.75	29.75	29.75
Ground Terminal Diameter	cm	700	700	700	700	700	700	700
Transponder HPA size	dBW	23	23	23	23	23	23	23
Ground Terminal Antenna Gain	dBi	64.8	64.8	64.8	64.8	64.8	64.8	64.8
Ground Terminal EIRP	dBW	87.8	87.8	87.8	87.8	87.8	87.8	87.8
Elevation Angle	Degree	20	20	20	20	20	40	50
Range to Satellite	km	39554	39554	39554	39554	39554	37780	37078
Path Loss	dB	213.86	213.86	213.86	213.86	213.86	213.46	213.29
Atmospheric & Other Losses	dB	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Availability		-	**99.70%**	**99.70%**	**99.70%**	**99.70%**	**99.70%**	**99.70%**
Rain Attenuation	dB	0	3.17	4.93	5.66	10.06	13.69	16.98
satellite System Noise Temp	K	600	600	600	600	600	600	600
Satellite Receive G/T	dB/K	13.42	13.42	13.42	13.42	13.42	13.42	13.42
Satellite Received C/N	dB	29.66	26.49	24.73	24.00	19.59	16.36	13.24
Intra-System Interference C/I	dB	19.4	19.4	19.4	19.4	19.4	19.4	19.4
Inter-System Interference C/I	dB	27	27	27	27	27	27	27
Total Received C/(N+I)	dB	18.37	18.04	17.74	17.58	16.12	14.37	12.16
Required C/(N+I)	dB	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Margin	dB	14.27	13.94	13.64	13.48	12.02	10.27	8.06

Table 3.7.2 - 1 Ka-Band Link Budget (Uplink)

ANNEX 1 - PCG SAMSAT SERIES FILINGS

NAME	LONG	OPOS	ADMN	STAT	AREC	APUB	AR11	CREC	CPUB	CR11	FREQ
SAMSAT-3	89	W	G	C	27-Feb-95	03-Oct-95	1345	27-Aug-95	08-Apr-97	2684	X + Ka (1)
SAMSAT-2	82	W	G	C	27-Feb-95	03-Oct-95	1344	27-Aug-95	08-Apr-97	2683	X + Ka (1)
SAMSAT-1	75	W	G	C	27-Feb-95	03-Oct-95	1343	27-Aug-95	08-Apr-97	2682	X + Ka (2)

NOTES: (1) PCG intends to use only Ka-band frequencies for uplinks and downlinks within the USA.

(2) SAMSAT-1 will provide service to Central and South America and connectivity for those markets to Europe.

ANNEX 2

UK DUE DILIGENCE REQUIREMENT AND STATUS OF COORDINATION

1 - LICENSING

PCG has filed its Advanced Publication Information and Requests for Co-ordination to the ITU via the U.K. Administration and are, therefore, subject to U.K. jurisdiction. Filing details are summarized in Annex 1 to Attachment C.

For the provision of services inside the U.K., appropriate licenses are issued by the U.K. Administration. These licenses are similar to those issued by the FCC for USA service, covering spectrum authorizations and ground station approvals. For the provision of services in non-British territories, market access requests, such as this one to the FCC, are made by PCG directly to the sovereign administrations involved.

2 - U.K. DUE DILIGENCE

2.1 - Provisions

The U.K. have taken the lead in Europe in promoting due diligence procedures, and to this end instituted a formal process in 1996. The procedures are designed to ensure that:

a) the requisite technical information is properly furnished to the U.K. Administration and the ITU.
b) the operator vigorously pursues the ITU co-ordination process both formally via administration-to-administration co-ordination meetings and informally through operator-to-operator direct meetings.
c) the operators have the legal, technical and financial competence to establish their networks.
d) the orbital resources filed with the ITU are aligned with the requirements of their business plans.
e) the operators establish their networks in conformance with the time scales contained in their business plans.
f) progress reports are provided at least yearly. Non-compliance may result in filings being withdrawn from the ITU.

It is PCG's understanding that the U.K.'s procedures are more stringent than those adopted at the recently concluded WRC 97.

2.2 - PCG Progress

2.2.3 - PCG's Request for Co-ordination to the ITU

PCG's filings are now fully published. Dates and ITU Special Section numbers are given in Annex 1 of the Technical Specification.

PCG has been vigorously pursing co-ordination on a global basis since 1995, and to date has held 9 formal co-ordination meetings, in addition to a similar number of informal operator-to-operator meetings. A further 16 meetings have been either confirmed or requested through the end of 1998. One meeting with the U.S.A.'s NTIA was held in July 1997 to discuss coordination with USA government systems. Another confirmed meeting will be held in London in February 1998 with representatives of the NTIA, the FCC and USA operators. Meetings with two Central and South American countries are scheduled for 1998.

2.2.4 - Progress Report

PCG are currently in the process of providing the U.K. with a progress update. This will highlight the addition of our innovative asymmetrical network strategies, fully compatible with our existing filings, and with the establishment of SAMSAT networks within the time frame in our original due diligence submission.

3 - British National Space Centre

This U.K. Government Agency has the responsibility to ensure that operators under U.K. jurisdiction operate in compliance with the U.K.'s Outer Space Act. This Act fulfils the U.K.'s treaty obligations relating to the peaceful use of outer space. Submissions call for information on company corporate details and very specifically lay out mandatory launch insurance requirements. Authority to launch is denied until the BNSC is satisfied that appropriate insurance arrangements are in place.

PCG will seek BNSC authority to launch at the appropriate time, and confirms that it will comply with all BNSC requirement.

4 - Other Requirements

PCG are not aware of any other mandatory due diligence requirement, either national, regional or global, for FSS Ka-band satellite markets, but are committed to complying with those required by any competent authority.

CERTIFICATION OF PERSON RESPONSIBLE FOR PREPARING ENGINEERING INFORMATION

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this document and the exhibits attached hereto; that I am familiar with Part 25 of the Commission's rules; that I am familiar with the provisions in the ITU Radio Regulations relating to FSS networks; that I have either prepared or reviewed the engineering information submitted in this application and that it is complete and accurate to the best of my knowledge and belief.

By: Ray Kennedy

Ray Kennedy
Executive Vice President
Pacific Century Group

Date: 13th Dec 1997

CERTIFICATE

Pacific Century Group, Inc. hereby certify that all of the statements contained herein are true, complete and accurate to the best of its information, knowledge and belief, and are made in good faith.

Respectfully submitted,

PACIFIC CENTURY GROUP, INC.

By: _____

Name: George Chan

Title: Executive Vice President

Date: December 22, 1997

COUDERT BROTHERS
ATTORNEYS AT LAW

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December 29, 1997

Magalie Roman Salas
Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Pacific Century Group Letter of Intent as a Foreign Satellite Operator to Provide Fixed Satellite Services in the Ka-Band to the United States

Dear Ms. Salas:

On December 22, 1997, the Pacific Century Group ("PCG") filed a Letter of Intent as a Foreign Satellite Operator to Provide Fixed Satellite Services in the Ka-Band to the United States. There, we noted that facsimile copies of the Form 312 certification, general certification and affidavit had been filed and that original signature pages would be filed shortly. Enclosed please find those original signature pages which should now be included with PCG's Letter of Intent.

If you have any questions regarding the foregoing, please contact the undersigned.

Sincerely,

Tara K. Giunta, Esq.

Enclosures
Copy: Thomas Tycz
Fern Jarmulnek
Harry Ng
Steve Sharkey
Kathleen Campbell

(MON) 12. 22' 97 13:22/ST. 13:20/NO. 4261106276 P 4

CERTIFICATION

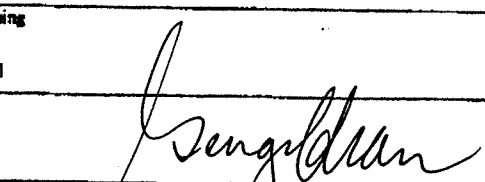
The Applicant waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application. The applicant certifies that grant of this application would not cause the applicant to be in violation of the spectrum aggregation limit in 47 CFR Part 20. All statements made in exhibits are a material part hereof and are incorporated herein as if set out in full in this application. The undersigned, individually and for the applicant, hereby certifies that all statements made in this application and in all attached exhibits are true, complete and correct to the best of his or her knowledge and belief, and are made in good faith.

42. Applicant is a (an): (Place an "X" in the box next to applicable response.)

☐ a. Individual ☐ b. Unincorporated Association ☐ c. Partnership ☒ d. Corporation ☐ e. Governmental Entity ☐ f. Other (Please specify) _____

43. Typed Name of Person Signing	44. Title of Person Signing
George Chan	Executive Vice President

45. Signature



46. Date: 12/22/97

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).

FROM COUDERT BROTHERS

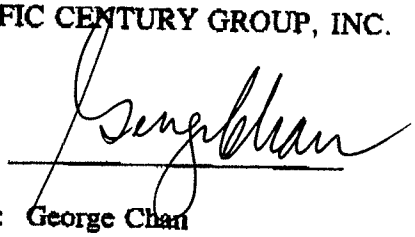
RECEIVED
DEC 29 1997
Federal Communications Commission
Office of Secretary

CERTIFICATE

Pacific Century Group, Inc. hereby certify that all of the statements contained herein are true, complete and accurate to the best of its information, knowledge and belief, and are made in good faith.

Respectfully submitted,

PACIFIC CENTURY GROUP, INC.

By: 

Name: George Chan

Title: Executive Vice President

Date: December 22, 1997

AFFIDAVIT

I, George Chan, do hereby swear, under penalty of perjury, that:

1. I am Executive Vice President of Pacific Century Group, Inc., and I have personal knowledge of the matters hereinafter referred to, and make this affidavit in support of the Letter of Intent filed by Pacific Century Group, Inc. in the Federal Communications Commission's Ka-band second processing round.

2. the financial information contained in the Letter of Intent is true and accurate to the best of my knowledge and belief.

George Chan

Dated: December 22, 1997