

READ INSTRUCTIONS CAREFULLY BEFORE PROCEEDING

APPROVED BY OMB 3060-0589

FEDERAL COMMUNICATIONS COMMISSION REMITTANCE ADVICE

SPECIAL USE
FCC USE ONLY

(1) LOCKBOX # 358210

PAGE NO. 1 OF 1

SECTION A - PAYER INFORMATION

(2) PAYER NAME: Orion Network Systems, Inc.
(3) TOTAL AMOUNT PAID: \$1,215.00
(4) STREET ADDRESS LINE NO. 1: 2440 Research Boulevard
(5) STREET ADDRESS LINE NO. 2: Suite 400
(6) CITY: Rockville
(7) STATE: MD
(8) ZIP CODE: 20850
(9) DAYTIME TELEPHONE NUMBER: 301/258-8101
(10) COUNTRY CODE

IF PAYER NAME AND THE APPLICANT NAME ARE DIFFERENT, COMPLETE SECTION B
IF MORE THAN ONE APPLICANT, USE CONTINUATION SHEETS (FORM 150-C)

SECTION B - APPLICANT

36-SAT-AMEND-98
amends 23-SAT-P/LA-96

(11) APPLICANT NAME: Orion Network Systems - Asia Pacific, Inc.
(12) STREET ADDRESS LINE NO. 1: 2440 Research Boulevard
(13) STREET ADDRESS LINE NO. 2: Suite 400
(14) CITY: Rockville
(15) STATE: MD
(16) ZIP CODE: 20850
(17) DAYTIME TELEPHONE NUMBER: 301/258-8101
(18) COUNTRY CODE

COMPLETE SECTION C FOR EACH SERVICE, IF MORE BOXES ARE NEEDED, USE CONTINUATION SHEETS (FORM 159-C)

SECTION C - PAYMENT INFORMATION

(19A) FCC CALL SIGN/OTHER ID
(20A) PAYMENT TYPE CODE (PTC): C W Y
(21A) QUANTITY: 1
(22A) FEE DUE FOR (PTC) IN BLOCK 20A: \$1,215.00
(23A) FCC CODE 1
(24A) FCC CODE 2
(19B) FCC CALL SIGN/OTHER ID
(20B) PAYMENT TYPE CODE (PTC)
(21B) QUANTITY
(22B) FEE DUE FOR (PTC) IN BLOCK 20B
(23B) FCC CODE 1
(24B) FCC CODE 2
(19C) FCC CALL SIGN/OTHER ID
(20C) PAYMENT TYPE CODE (PTC)
(21C) QUANTITY
(22C) FEE DUE FOR (PTC) IN BLOCK 20C
(23C) FCC CODE 1
(24C) FCC CODE 2
(19D) FCC CALL SIGN/OTHER ID
(20D) PAYMENT TYPE CODE (PTC)
(21D) QUANTITY
(22D) FEE DUE FOR (PTC) IN BLOCK 20D
(23D) FCC CODE 1
(24D) FCC CODE 2

SECTION D - TAXPAYER INFORMATION (REQUIRED)

(25) PAYER TIN
(26) COMPLETE THIS BLOCK ONLY IF APPLICANT NAME IN B-11 IS DIFFERENT FROM PAYER NAME IN A-2
APPLICANT TIN

SECTION E - CERTIFICATION

(27) CERTIFICATION STATEMENT
I, _____, Certify under penalty of perjury that the foregoing and supporting information are true and correct to the best of my knowledge, information and belief. SIGNATURE _____

SECTION F - CREDIT CARD PAYMENT INFORMATION

(28) MASTERCARD VISA ACCOUNT NUMBER
EXPIRATION DATE: MONTH YEAR
DATE
I hereby authorize the FCC to charge my VISA or MASTERCARD for the service(s)/authorizations(s) herein described. AUTHORIZED SIGNATURE

VERNER · LIIPFERT
BERNHARD · MCPHERSON ^{OF} HAND
CHARTERED

Writer's Direct Dial:
(202) 371-6111

901 - 15TH STREET, N.W.
WASHINGTON, D.C. 20005-2301
(202) 371-6000
FAX: (202) 371-6279

December 22, 1997

VIA HAND DELIVERY

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
International Bureau - Satellites
P.O. Box 358210
Pittsburgh, PA 15251-5210

Re: Application of Orion Asia Pacific Corporation for a GSO/FSS Space Station
in the Ka-Band at 39 E.L. (filed November 9, 1995)

Dear Ms. Secretary:

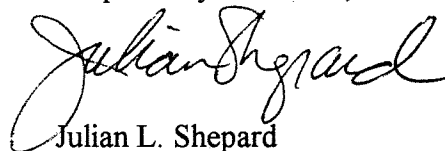
Enclosed herewith on FCC Form 312 is an Amendment (with accompanying narrative description and exhibits) to the above-referenced application to make changes to conform to the Ka-band frequency allocation for GSO/FSS systems.

Subsequent to the filing of the above-referenced application, Orion Asia Pacific Corporation changed its corporate name to Orion Network Systems - Asia Pacific, Inc. There was no change in the ownership of Orion Asia Pacific Corporation.

Also enclosed is a Form 159 remittance advice and a check in the amount of \$1,215.00 to cover the requisite application filing fee.

Kindly direct any questions regarding this application to the undersigned at (202) 371-6111.

Respectfully submitted,



Julian L. Shepard

Enclosures

HOUSTON, TEXAS
1111 BAGBY, SUITE 4700
HOUSTON, TEXAS 77002
(713) 225-7200
FAX: (713) 752-2199

AUSTIN, TEXAS
SAN JACINTO CENTER
98 SAN JACINTO BLVD., SUITE 1440
AUSTIN, TEXAS 78701
(512) 703-6000
FAX: (512) 703-6003

HONOLULU, HAWAII
HAWAII TOWER-ALFAC CENTER
745 FORT STREET, SUITE 600
HONOLULU, HAWAII 96813
(808) 566-0999
FAX: (808) 566-0995

MCLEAN, VIRGINIA
8280 GREENSBORO DRIVE
SUITE 601
MCLEAN, VIRGINIA 22102
(703) 749-6000
FAX: (703) 749-6027

FCC 312
Main Form

FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS

Approved by OMB
3060-0078
Est. Avg. Burden: Hour
Per Response: 10 Mins.

FCC Use Only
File Number:
Call Sign:

PAYOR AND FILING FEE INFORMATION

a. Payor Name Orion Network Systems, Inc.		b. Daytime Telephone Number (301) 258-3200	
c. Mailing Street Address or P.O. Box 2440 Research Boulevard, Suite 400		d. FCC Account Number	
e. City Rockville	f. State MD	g. Zip Code 20850-3228	h. Country Code (if not U.S.A.)
i. Payment Type Code CWY	j. Quantity 1	k. Fee Due for Payment Type Code in (i) \$1,215.00	l. Total Amount Paid \$1,215.00

APPLICANT INFORMATION

1. Legal Name of Applicant Orion Network Systems - Asia Pacific, Inc.		2. Voice Telephone Number (301) 258-3200	
3. Other Name Used for Doing Business (if any) Orion Asic Pacific Corporation (previous name)		4. Fax Telephone Number (301) 258-3360	
5. Mailing Street Address or P.O. Box 2440 Research Boulevard, Suite 400		6. City Rockville	8. Zip Code 20850-3228
7. State / Country (if not U.S.A.) MD		10. Voice Telephone Number (202) 371-6000	
9. Name of Contact Representative (if other than applicant) Thomas J. Keller and Julian L. Shepard		12. Fax Telephone Number (202) 371-6279	
11. Firm or Company Name Vermer, Lipfert, Bernhard, McPherson and Hand, Chartered		14. City Washington	
13. Mailing Street Address or P.O. Box 901 15th Street, N.W., Suite 700		15. State / Country (if not U.S.A.) D.C.	
ATTENTION:		16. Zip Code 20005-2301	

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.

<input type="checkbox"/> a1. Earth Station	<input type="checkbox"/> b1. Application for License of New Station	<input type="checkbox"/> b4. Modification of License or Registration	<input type="checkbox"/> b7. Notification of Minor Modification
<input checked="" type="checkbox"/> a2. Space Station	<input type="checkbox"/> b2. Application for Registration of New Domestic Receive-Only Station	<input type="checkbox"/> b5. Assignment of License or Registration	<input type="checkbox"/> b8. Other (Please Specify):
	<input checked="" type="checkbox"/> b3. Amendment to a Pending Application	<input type="checkbox"/> b6. Transfer of Control of License or Registration	

18. If this filing is in reference to an existing station, enter:
Call sign of station: N/A
(a) Date pending application was filed: November 9, 1995
(b) File number of pending application:

TYPE OF SERVICE

20. NATURE OF SERVICE: This filing is for an authorization to provide or use the following type(s) of service(s): Place an "X" in the box(es) next to all that apply.

- a. Fixed Satellite b. Mobile Satellite c. Radiodetermination Satellite d. Earth Exploration Satellite e. Other (please specify)

21. STATUS: Place an "X" in the box next to the applicable status. Mark only one box.

- a. Common Carrier b. Non-Common Carrier a. Using U.S. licensed satellites b. Using Non-U.S. licensed satellites

N/A

22. If applicant is providing INTERNATIONAL COMMON CARRIER service, see instructions regarding Sec. 214 filings. Mark only one box. Are these facilities:

- a. Connected to the Public Switched Network b. Not connected to the Public Switched Network

N/A

24. FREQUENCY BAND(S): Place an "X" in the box(es) next to all applicable frequency band(s).

- a. C-Band (4/6 GHz) b. Ku-Band (12/14 GHz) c. Other (Please specify) Ka -Band

TYPE OF STATION

25. CLASS OF STATION: Place an "X" in the box next to the class of station that applies. Mark only one box.

- a. Fixed Earth Station b. Temporary-Fixed Earth Station c. 12/14 GHz VSAT Network d. Mobile Earth Station e. Space Station f. Other (Specify)

If space station applicant, go to Question 27.

26. TYPE OF EARTH STATION FACILITY. Mark only one box.

- a. Transmit/Receive b. Transmit-Only c. Receive-Only

PURPOSE OF MODIFICATION OR AMENDMENT

27. The purpose of this proposed modification or amendment is to: Place an "X" in the box(es) next to all that apply.

- | | |
|-------------------------------------|---|
| <input type="checkbox"/> | a -- authorization to add new emission designator and related service |
| <input type="checkbox"/> | b -- authorization to change emission designator and related service |
| <input type="checkbox"/> | c -- authorization to increase EIRP and EIRP density |
| <input type="checkbox"/> | d -- authorization to replace antenna |
| <input type="checkbox"/> | e -- authorization to add antenna |
| <input type="checkbox"/> | f -- authorization to relocate fixed station |
| <input checked="" type="checkbox"/> | g -- authorization to change assigned frequency(ies) |
| <input type="checkbox"/> | h -- authorization to add Points of Communication (satellites & countries) |
| <input type="checkbox"/> | i -- authorization to change Points of Communication (satellites & countries) |
| <input type="checkbox"/> | j -- authorization for facilities for which environmental assessment and radiation hazard reporting is required |
| <input type="checkbox"/> | k -- Other (Please Specify) |

ENVIRONMENTAL POLICY

28. Would a Commission grant of any proposal in this application or amendment have a significant environmental impact as defined by 47 CFR 1.13077? If YES, submit the statement as required by Sections 1.1308 and 1.1311 of the Commission's rules, 47 C.F.R. §§ 1.1308 and 1.1311, as Exhibit A to this application.

A Radiation Hazard Study must accompany all applications as Exhibit B for new transmitting facilities, major modifications, or major amendments. Refer to OET Bulletin 65.

- YES NO

ALIEN OWNERSHIP

29. Is the applicant a foreign government or the representative of any foreign government?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
30. Is the applicant an alien or the representative of an alien?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
31. Is the applicant a corporation organized under the laws of any foreign government?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> 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?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> 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?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> 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.		

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.	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> 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.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> 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?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> 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?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> 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 preceding two items?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> 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.	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

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

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

James B. Kaufman

44. Title of Person Signing

Vice President and Assistant Secretary

45. Signature



46. Date

December 22, 1997

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).

EXHIBIT C
FCC FORM 312 APPLICATION OF
ORION NETWORK SYSTEMS - ASIA PACIFIC, INC.
DECEMBER 22, 1997

The applicant corporation, Orion Network Systems -Asia Pacific, Inc., is a wholly-owned subsidiary of Orion Network Systems, Inc. ("ONSI") Approximately 26.3 percent of the ONSI's stock that is not publicly traded is held by the following U.S. subsidiaries of foreign corporations. The amount of ONSI's public-traded stock owned of record or voted by aliens is unknown. In any event, this information is not applicable to the instant application which seeks a non-common carrier authorization.

British Aerospace Holdings, Inc. (foreign parent entity is British)	18.0%
NCN Sat US, Inc. (foreign parent entity is French)	4.4%
Trans-Atlantic Satellite, Inc. (foreign parent entity is Japanese)	3.9%

EXHIBIT D
FCC FORM 312 APPLICATION OF
ORION NETWORK SYSTEMS - ASIA PACIFIC, INC.
DECEMBER 22, 1997

As set forth in the attached Amendment of Orion Network Systems - Asia Pacific, Inc., to Application for Authority to Construct, Launch and Operate the Orion-F5 Separate International Communications Satellite System, the applicant conditionally requests waiver of Section 25.114(c)(13) of the Commission's rules, 47 C.F.R. §25.114(c)(13).

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

Amendment of

ORION NETWORK SYSTEMS - ASIA PACIFIC, INC.

To

Application of Orion Asia Pacific Corporation for
Authority to Construct, Launch and Operate
the Orion-F5 Separate International
Communications Satellite System

ORION NETWORK SYSTEMS - ASIA PACIFIC, INC.
2440 Research Blvd., Suite 400
Rockville, Maryland 20850
(301) 258-3200

December 22, 1997

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

In the Matter of the Application of)
)
Orion Asia Pacific Corporation) File No.
)
For Authority to Construct, Launch)
and Operate the Orion-F5 Separate)
International Communications)
Satellite System)

AMENDMENT

Orion Network Systems - Asia Pacific, Inc. ("OAPI") pursuant to Sections 308, 309 and 319 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 308, 309 and 319 ("Communications Act") and Sections 25.114 of the Commission's Rules, 47 C.F.R. § 25.114, hereby submits this amendment to its above-captioned application to construct, launch and operate a satellite space station in the Ka-band, on a non-common carrier basis. The preferred orbital location for the Orion-F5 satellite is 139° East Longitude ("E.L."), which is currently an unassigned orbital location in the Ka-Band.

In support of this amendment to the application, OAPI submits the following information.

I. NAME, ADDRESS AND TELEPHONE NUMBER OF APPLICANT

Orion Network Systems - Asia Pacific, Inc.
2440 Research Blvd., Suite 400
Rockville, MD 20850
301-258-3200

II. CORRESPONDENCE

Correspondence with respect to this application should be sent to the following person at the above address and telephone number:

Richard H. Shay, Esquire
Vice President of Corporate and Legal Affairs

with a copy to:

Thomas J. Keller, Esq.
Julian L. Shepard, Esq.
Verner, Liipfert, Bernhard, McPherson & Hand
901 15th Street, N.W.
Washington, D.C. 20005
Telephone: (202) 371-6060
Fax: (202) 371-6279

III. PROPOSED AMENDMENT

On November 9, 1995, Orion Asia Pacific Corporation filed the above-referenced application for authority to construct, launch, and operate a separate international Ka-Band space station at 139° E.L. Subsequently, without any change in ownership, Orion Asia Pacific Corporation changed its corporate name to Orion Network Systems - Asia Pacific, Inc. The application was filed as a pre-requisite for the Commission's submission of AP4 materials to the

ITU's Radiocommunications Bureau, in accordance with the Bureau's instructions after the cut-off date for applications in the First Ka-Band Processing Round.

OAPI hereby formally amends its application: (1) to specify a frequency plan for the proposed space station that is consistent with the Ka-Band frequency plan adopted by the Commission subsequent to OAPI's original application (See Revised Technical Description attached hereto as Exhibit 1); and (2) to comply with other requirements set forth in the Ka-Band service rules adopted subsequent to OAPI's original application (See Exhibit 1). In addition, OAPI hereby supplements the information in its original application to reflect the Commission's grant of authority to construct, launch, and operate various satellite space stations to OAPI, its parent corporation, or subsidiaries thereof, subsequent to the filing of the application (See Other Orion FCC Satellite Applications and Authorizations attached hereto as Exhibit 4), and to reflect the recently filed application for Commission consent to the transfer of control of Orion Network Systems, Inc. to Loral Space & Communications Ltd ("transfer application").^{1/}

IV. SATELLITE TECHNICAL DESCRIPTION INCLUDING RADIO FREQUENCY AND POLARIZATION PLAN

See Revised Technical Description attached hereto as Exhibit 1.

^{1/} File Nos. 1-SAT-TC-98(5); 2-SAT-TC-98(3); 3-SAT-TC-98; 46-DSE-TC-98(32); KA353-X; 47-DSE-TC-98(16); KA353-X; 48 DSE-TC-98; E970023; 47-DSE-TC-98(3); KA-461; 50-DSE-TC-98(2); KA399; ITC-97-610-TC.

V. DATES BY WHICH SIGNIFICANT MILESTONES ARE LIKELY TO BE ACHIEVED

A schedule specifying dates by which significant milestones in establishment of the ORION-F5 satellite system are planned to be achieved is set forth in Exhibit 3 in the Revised Technical Description attached hereto.

VI. ESTIMATED PROGRAM COSTS

OAPI has analyzed the costs associated with the spacecraft, launch and insurance, TT&C, and first year operation of the satellite communications system that is the subject of this application, as set forth in Exhibit 2 in the Revised Technical Description attached hereto.

VII. REGULATORY QUALIFICATIONS

When OAPI's application was filed originally, the Commission allowed the financial qualification showing for separate satellite system applicants to be accomplished in two stages in order to accommodate the unique circumstances applicable to the international satellite environment.^{2/} Accordingly, as set forth in the application, OAPI stated it would raise funds in the capital markets to finance the construction, launch and operation of the satellite. OAPI stated it would make a complete and final financial showing following conclusion of the INTELSAT consultation for Orion-F5.

^{2/} Establishment of Satellite Systems Providing International Communications, 101 F.C.C.2d 1046, 1164 (1985), recon. 61 RR2d 649 (1986), further recon., 1 FCC Rec. 439 (1986).

In processing the first-round of Ka-Band applications, the Commission waived the financial qualifications requirements. The Commission did not look to current financial ability as a prerequisite to a license grant. By licensing all current commercial system applicants in the processing round, the Commission expressly acknowledged that it was enabling small entities and start-up companies the opportunity to compete in the capital-intensive satellite industry. Subsequently, in the Third Report and Order in CC Docket No. 92-297, released October 15, 1997, the Commission noted that this waiver applied to this first processing group only, and that the application of the Part 25 financial requirements to any future Ka-Band processing round would be addressed in the context of that processing round.^{3/}

OAPI asserts that the two-step financial qualification procedure applicable in place at the time it filed its application applies to its application as amended. However, if the Commission determines that the Part 25 financial qualification requirements are to be applied retroactively to this application, OAPI hereby requests a waiver of Section 25.114(c)(13) pursuant to Section 1.3 of the Commission's rules, 47 C.F.R. §1.3, to permit Orion to make its financial qualification showing in accordance with the two-step financial qualification rules in effect as of the date its application was filed. In the alternative, if the Commission decides not to grant the requested waiver, OAPI respectfully recommends that the Commission defer the required financial showing until a later date, after the Commission acts on the pending

^{3/} 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 Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, CC Docket No. 92-297, FCC 97-378, released Oct. 15, 1997 ("Third Report and Order"), ¶18.

application for consent to the transfer of control of Orion Network Systems, Inc. to Loral Space & Communications Ltd. At that time OAPI would make a more complete and current financial showing.

Grant of the requested waiver, or, in the alternative, temporary deferral of the financial qualification showing, is in public interest as it would preserve the equities of an earlier decision by the staff of the International Bureau to ensure fairness in the treatment of Orion vis-a-vis its competitor, PanAmSat. Indeed, the timing of Orion's original application was the product a decision by the Commission's staff to permit Orion the same opportunity as the Commission granted its competitor, PanAmSat, regarding the filing of Ka-Band AP-4 materials with International Telecommunications Union ("ITU"). Because PanAmSat had filed applications for certain orbital locations after the cut-off date for the first Ka-Band application processing round, and the Commission intended to file AP-4 materials for those locations in November, 1995, before the WRC-95 potentially adopted resolutions impeding the Commission's ability to do so in the near future, the Commission agreed to file AP-4 materials for two additional orbital locations of importance to Orion provided that Orion immediately filed formal applications for those locations. At that time, the Commission had not adopted financial qualification rules for the Ka-Band.

Moreover, grant of the amended application and grant of requested waiver, or, in the alternative, temporary deferral of the financial qualification showing, would promote competition by enabling Orion, a pioneer and well-established operator in the business of separate international satellite systems, to pursue its plan to grow and expand its private network service offerings, including Internet, voice, data, and video transmission, directly to

domestic and international business enterprises worldwide. In competition with the world's largest satellite system owners, both foreign and domestic, Orion strives to provide its customers the best and most competitive network services, with responsive and innovative features such as 60-day installation, a single point of contact for sales and maintenance, and international 24-hour seven-day-per-week support. Firms in both the domestic and international markets would benefit from such a competitive and customer-focused presence of Orion in the marketplace for additional Ka-Band satellite services.

Finally, the Commission previously has waived the financial qualification requirements for many Ka-Band space station applicants, and has repeatedly noted the efficacy of enforcing construction milestones as an alternative to up-front financial qualification showings.^{4/} In this case, OAPI does not seek to defer a financial qualification showing indefinitely. OAPI merely seeks to satisfy the requirements in effect at the time it filed its application, or, in the alternative, to have the Commission temporarily defer a financial showing. Orion's demonstrated track record of success in raising the debt and equity financing for, building and operating international satellite systems is testimony to Orion's ability to duplicate that achievement in the context of additional satellites in the Orion constellation. However, until the Commission acts on the pending transfer application, and the merger transaction is

^{4/} See *Norris Satellite Communications, Inc. For Authority to Construct, Launch, and Operate a Ka-Band Satellite System*, Order, 11 FCC Rcd 5402 (1996). The Commission recently affirmed the Bureau's decision. See *Application for Review of Order Denying Extension of Time to Construct and Launch Ka-Band Satellite System*, Memorandum Order and Opinion, FCC No. 97-377, (released October 10, 1997).

resolved, it would be difficult to secure financing in the form of fully negotiated unconditional debt and equity commitments of the type referred to in Section 25.140.

VIII. LEGAL QUALIFICATIONS OF APPLICANT

Orion's Common Carrier and Satellite Radio Licensee Qualification Report (FCC Form 430), filed with the Commission on March 30, 1997, is incorporated herein by reference.

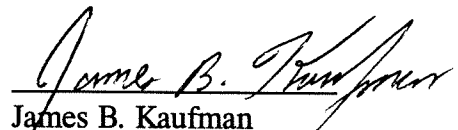
IX. WAIVER OF CLAIMS

OAPI 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 construction authority in accordance with this application. All statements made in the attached exhibits are a material part hereof, and are incorporated herein as if set out in full in this application.

The undersigned, an officer of OAPI, acting on its behalf, certifies that the statements made in this application are true, complete, and correct to the best of his knowledge and belief, and are made in good faith.

The undersigned also certifies that neither OAPI nor any party to this application is subject to a denial of federal benefits pursuant to Section 5301 of the Anti-drug Abuse Act of 1988, 21 U.S.C. § 853a.

Orion Network Systems - Asia Pacific, Inc.


James B. Kaufman
Vice President and Assistant Secretary

Date: December 22, 1997

Exhibit 1

Revised Technical Description

ORION-F5 at 139° E.L.

for

Ka-Band Services

Exhibit 1

**Revised
Technical Description**

**ORION F5 at 139E
for
Ka-Band Services**

Exhibit 1

Technical Description of ORION F5 Satellite

1. Introduction and Orbital Location

The requested orbital location for the ORION F5 is 139° E longitude. This satellite which will be co-located with the Orion AP-1 satellite will operate at Ka-band and form an important part of the Orion global satellite network. The satellite will provide a variety of digital services throughout the Asia Pacific Region using a number of fixed spot beams and steerable spot beams. The spacecraft will implement on-board baseband processing (OBP) and baseband switching.

The on-board processing repeater approach enables full interconnectivity to be provided among the multiple beams with improved transmission performance for digital services. The uplink access to the satellite will be by frequency division multiple access (FDMA), typically from small customer premises earth terminals using any of three fixed carrier rates (3.088 Mb/s, 1.544 Mb/s, and 384 kb/s). The downlink transmission for each transponder channel uses a single time division multiplexed (TDM) carrier at a fixed transmission rate of 90 Mb/s, including robust error-correction coding.

The ORION F5 satellite will provide full operational flexibility to meet the changing market needs for various customer requirements including video, voice and multimedia services throughout the Asia Pacific Region. The services envisaged include customer-premise offerings which can be provided with small low-cost terminals.

2. Ka-Band Coverage

The satellite provides 25 fixed spot beams over the Asia Pacific Region. In addition, there are two steerable spot beams. The steerable beams are movable anywhere to provide coverage to these areas not served by the fixed beams or can be overlaid on existing fixed beams to increase capacity to a particular location. The half power beam-width of each spot beam is 1 degree, providing coverage to an area of approximately 400 miles in diameter on the surface of the earth.

3. Frequency and Polarization Plan

The frequency bands employed are 28.35-28.60 GHz, 29.25-29.5 GHz and 29.50-30.00 GHz for uplink bands, and 18.30-18.55 GHz, 18.55-18.80 GHz and 19.70-20.20 GHz for downlink bands. These frequency band segments are consistent with the FCC Domestic Band Plan and have been assigned to GSO usage on a primary or co-primary basis. Full frequency reuse of these bands is achieved, for both uplink and downlink, by means of polarization and spatial isolation.

The center frequencies and polarizations of the transponders are shown in Figure 1 for the uplink and downlink, respectively. A total of 32 active transponders is possible each having a usable bandwidth of 114 MHz. The transponder center frequency spacing is 125 MHz. Frequency reuse by means of spatial and polarization isolation is used among the spot beams. Up to two transponders can be allocated to selected fixed downlink beams. An additional two transponders are possible into any fixed beam by means of overlaying one of the steerable spot beam.

The on-station command frequency will be at 30.0 GHz and the telemetry frequency at 18.30 GHz. Both these frequencies are selected subject to successful coordination. During transfer orbit the command and telemetry function will be done at Ku-band.

A telemetry beacon signal will be used for the purpose of earth station alignment and reference for uplink power control. The beacon will be located between 19.701-19.703 GHz subject to successful coordination.

4. Satellite Transmit Capability

Figure 2 shows the satellite antenna gain contours for each of the transmit spot beams. The figure shows the -4 dB contours for each beam. The steerable spot beams are identical to the fixed beams. The rolloff pattern of a typical spot beam is shown in the figure.

The Ka-band payload contains a total of 32 active traveling wave tubes (TWTAs) each having 60 Watts of saturated power. Adequate redundancy provisions for the TWTAs by means of four 10 for 8 redundancy rings will be used to meet the reliability objectives.

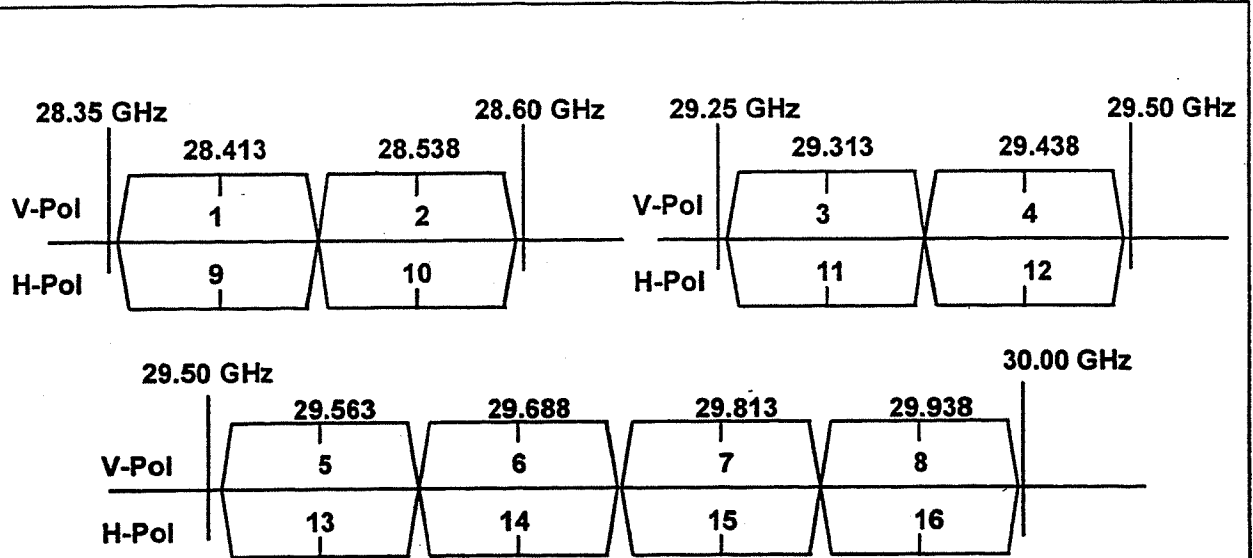
The EIRP budget for each beam is the following:

Parameter	Beam Peak	-4 dB Contour
Saturated TWTA output power	17.8 dBW	17.8 dBW
Output circuit loss	-2.5 dB	-2.5 dB
Transmit antenna gain	44.2 dBi	40.2 dBi
EIRP	59.5 dBW	55.5 dBW

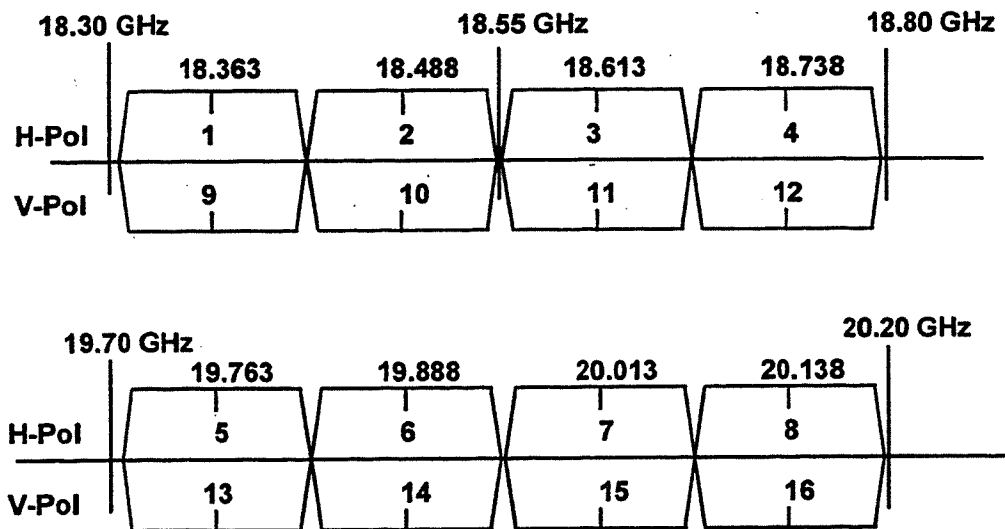
5. Satellite Receive Capability

Figure 3 shows the satellite antenna gain contours for each of the receiving spot beams. The figure shows the -4 dB contours for each beam. The steerable spot beams are identical to the fixed beams. The rolloff pattern of a typical spot beam is shown in the figure.

Figure 1. Frequency and Polarization Plan



(a). Uplink Frequency and Polarization Plan



(b). Downlink Frequency and Polarization Plan

Figure 2. Satellite Transmit Spot Beam Coverages

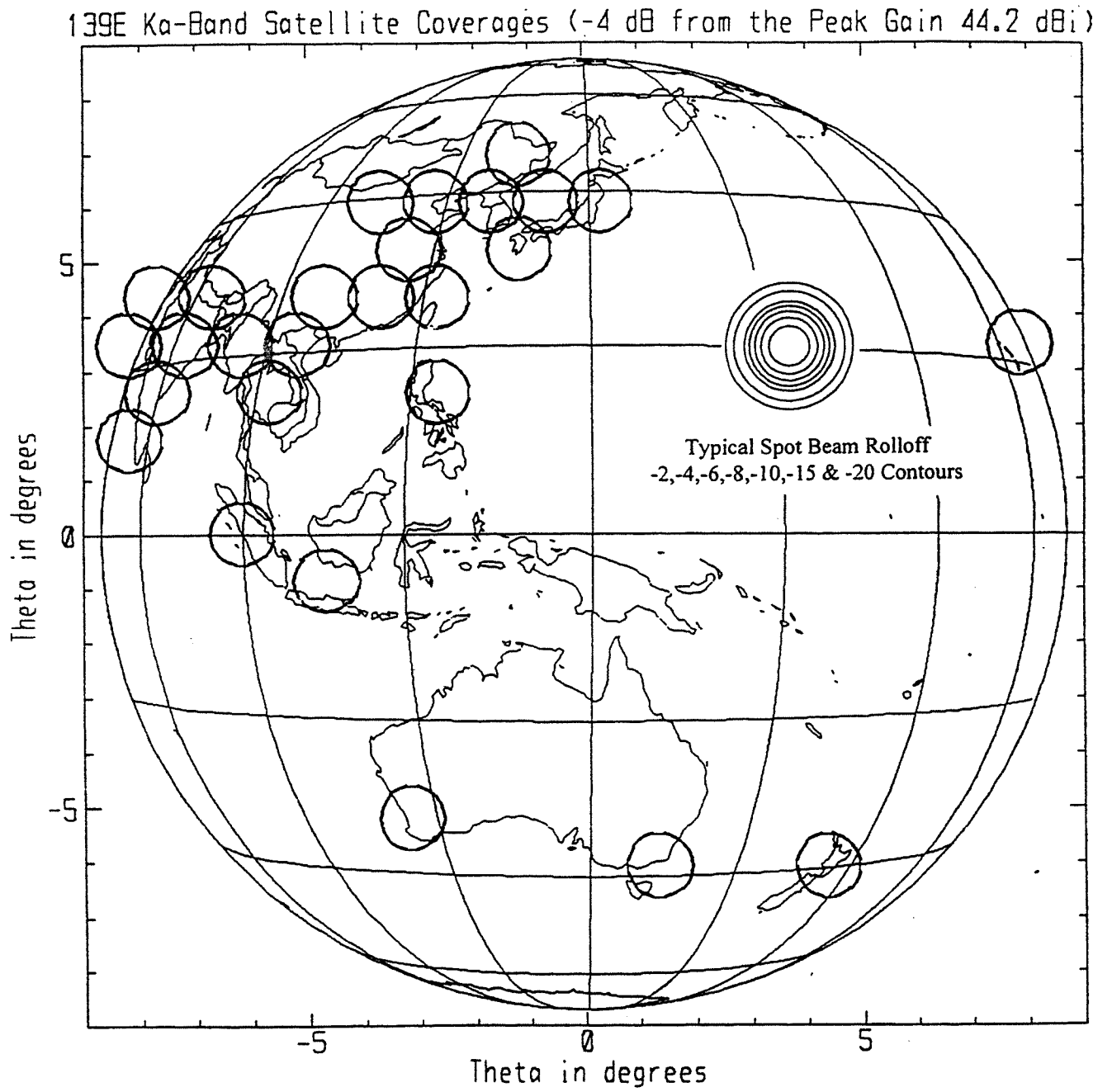
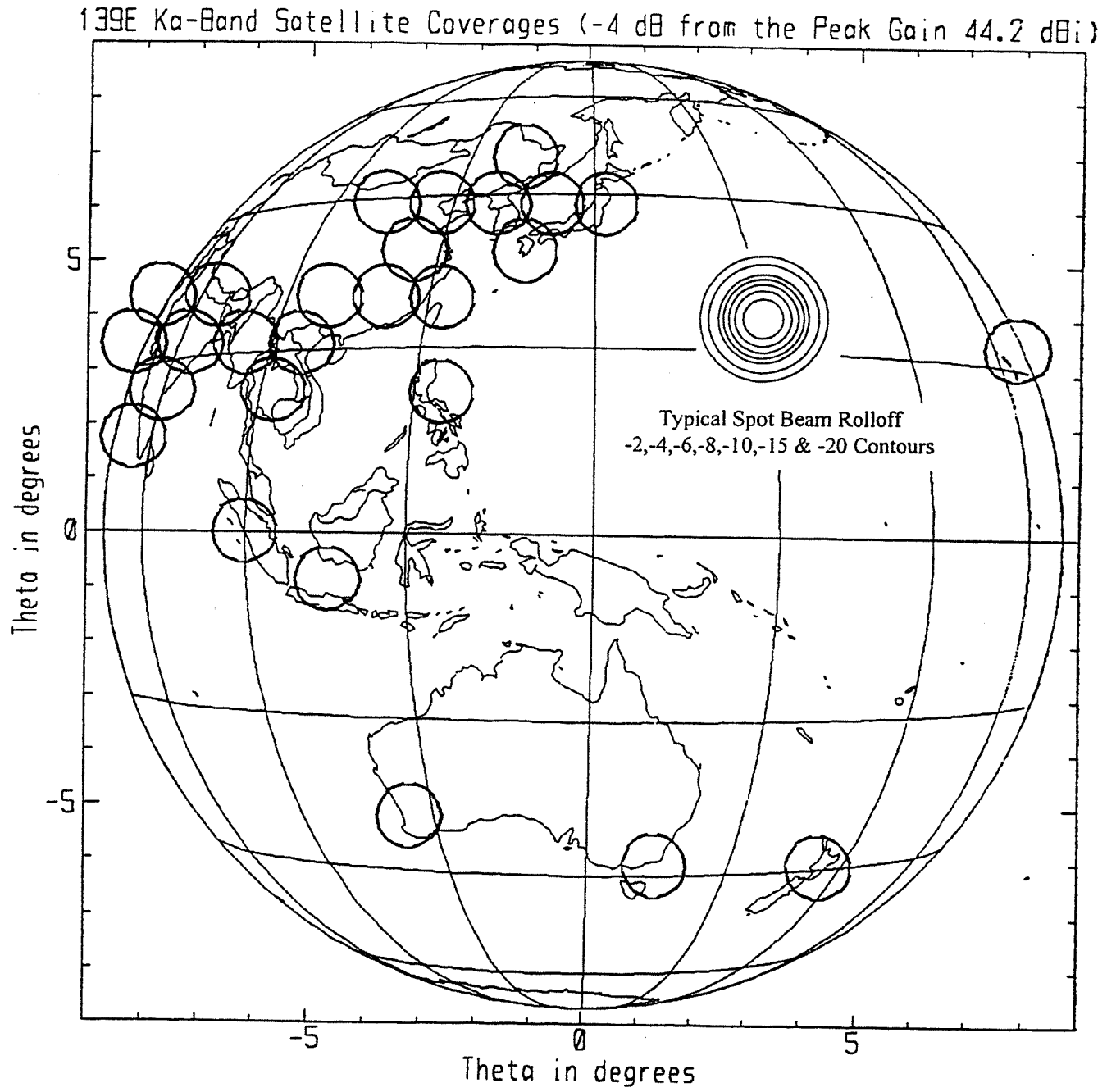


Figure 3. Satellite Receive Spot Beam Coverages



The satellite receiving system noise temperature is approximately 600 K. The budget for the satellite system figure of merit (G/T) is the following:

Parameter	Beam Peak	-4 dB Contour
Receive antenna gain	44.2 dBW	40.2 dBi
System noise temperature	27.8 dB/K	27.8 dB/K
Receive G/T	16.4 dB/K	12.4 dB/K

6. Connectivity

The OBP payload provides dynamic traffic routing on the packet-by-packet basis. The various data rate carriers uplinking in FDMA are digitally demultiplexed, demodulated and bits regenerated. The regenerated packets are rerouted individually to the designated downlink beam according to their burst address. The resulting bit stream of each downlink channel is then time-domain-multiplexed and transmitted to the designated downlink beams at a 90 Mbits rate.

7. Transponder Gain Control and Saturation Flux Density

The repeater will include an automatic gain control circuit (AGC) which operates with a 30 dB dynamic range. The repeater with on-board baseband processor provides constant downlink TDM carrier power independent of the uplink signal level, and the saturation flux density concept, which was used for the conventional "bent pipe" transponders, is not applicable.

8. Satellite Transponder Filter Response

The overall frequency response of a transponder is specified by the in-band and out-of-band attenuation masks shown in Figure 4. The in-band attenuation, relative to the peak in-band gain, does not exceed the limit shown in Figure 4a. The out-of-band attenuation, relative to the peak in-band gain exceeds the limit shown in Figure 4b.

FIGURE 4a - IN-BAND TRANSPONDER FILTER RESPONSE

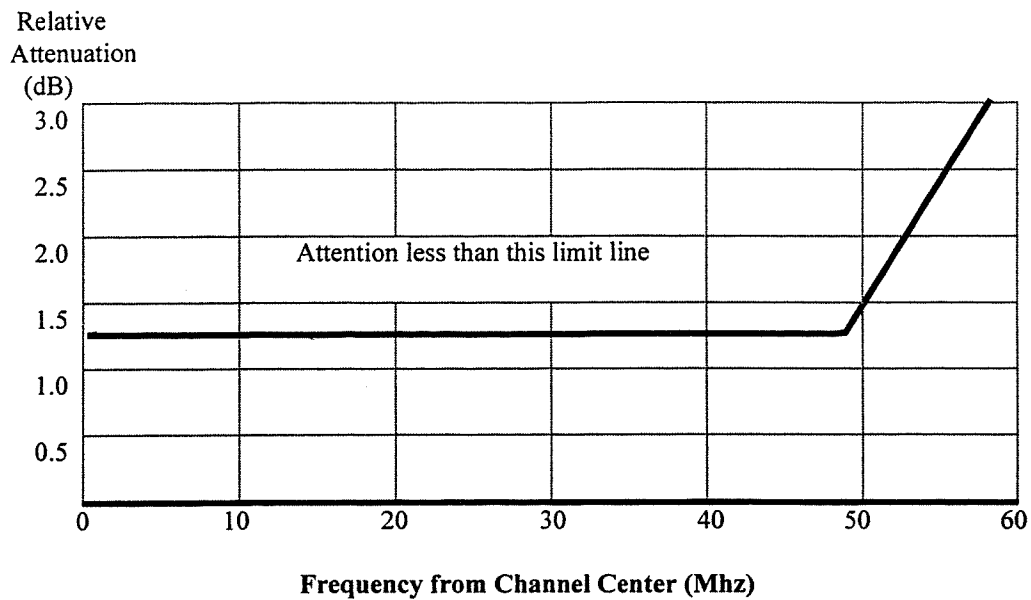
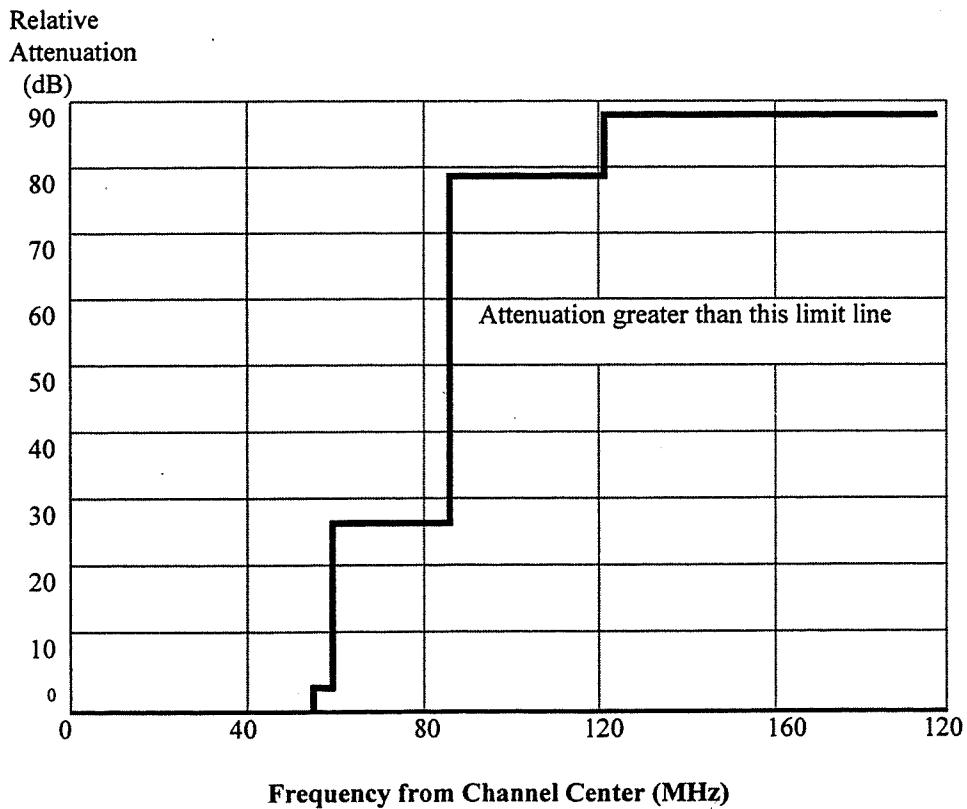


FIGURE 4b - OUT-OF-BAND TRANSPONDER FILTER RESPONSE



9. Emission Designators and Allocated Bandwidth of Emission

The following list provides a representative list of the emission designators for the system:

Transmission Type	Emission Designators	Directions
Digital TDM (90 Mb/s, FEC rate-1/2 with R-S)	114MG1W	Downlink
Digital SCPC (3.088 Mb/s, FEC rate-1/2 with R-S)	4M00G7W	Uplink
Digital SCPC (1.544 Mb/s, FEC rate-1/2 with R-S)	2M00G7W	Uplink
Digital SCPC (384 kb/s, FEC rate-1/2 with R-S)	500KG7W	Uplink
Command	1M50X9D	Uplink
Telemetry	300KG9D	Downlink
Beacon	40K0N0 X	Downlink

R-S: Reed-Solomon coding

10. Earth Stations

A variety of customer premise type earth stations ranging from 0.7 m to 2.4 m antenna will be used depending on the types of service required. For the information rates that will be used the RF terminal power requirements range from between 0.5-7 Watts.

All earth stations accessing the ORION-F5 satellite must adhere to Orion's established operational procedures. The sidelobe performance of all antennas operating in the 20/30 GHz bands will meet the FCC requirements of $29-25\log(\theta)$, thus ensuring compatible operation with adjacent satellites at spacings of 2 degrees. All transmissions will be monitored by Orion's Communications Systems Monitor (CSM) which determines the frequency and power level of each carrier to ensure they are within specification.

All operational procedures of the ORION-F5 satellite network will be compliant with the Commission's rules, sections 25.271 to 25.277.

11. Communications Services and Link Budgets

A full range of digital communications services will be provided. Typical services include the following:

- Digital services at 384 kb/s, 1.544 Mb/s and 3.088 Mb/s
- SCPC/FDMA uplink and TDM downlink access techniques
- PC-based computer data networks
- Fully meshed networks
- Digitally compressed video for teleconferencing and entertainment.

For many of these services, advanced FEC techniques, such as concatenated Reed-Solomon coding on top of Viterbi coding will be employed. In general availabilities greater than 99.5 % will be provided for all services. For higher availabilities uplink power control will be used at the transmit site.

Sample link budgets for the three uplink rates are shown in Figures 5-7.

Figure 5 shows a link budget for 0.7 m terminals for the 384 kb/s FDMA uplink and 90 Mb/s TDM downlink. QPSK modulation with FEC rate-1/2 and Reed-Solomon outer codes for error correction is used. Uplink Eb/No of 8 dB for the FDMA and downlink Eb/No of 5 dB for the TDM provide the target BER performance of 10^{-10} . The link budget shows that 0.7 m terminals with 1 W solid-state power amplifier (SSPA) can support the 384 kb/s transmission.

Figure 6 shows a representative link budget for 1.544 Mb/s FDMA uplink and 90 Mb/s TDM downlink using 1.2 m terminals. The transmission also employs QPSK modulation with FEC rate-1/2 and Reed-Solomon outer codes for error correction. Uplink Eb/No of 8 dB for the FDMA and downlink Eb/No of 5 dB for the TDM is used to meet the target BER performance of 10^{-10} . The link budget shows that 1.2 m terminals with 3 W solid-state power amplifier (SSPA) can support the T1 rate transmission.

Figure 7 shows a representative link budget for 3.088 Mb/s FDMA uplink and 90 Mb/s TDM downlink using 1.2 m terminals. The transmission also employs QPSK modulation with FEC rate-1/2 and Reed-Solomon outer codes for error correction. Uplink Eb/No of 8 dB for the FDMA and downlink Eb/No of 5 dB for the TDM is used to meet the target BER performance of 10^{-10} . The link budget shows that 1.2 m terminals with 7 W solid-state power amplifier (SSPA) can support the data rate transmission

The above link budgets demonstrate that the OBP payload can support high quality digital services using small customer premises terminals (0.7 m to 1.2 m).

Figure 5. Sample Link Budget for 384 kb/s Service using 0.7 m Terminals

On-Board Processing Satellite Link Performance Calculation			
Link parameters:	Unit	Value	
Uplink frequency	GHz	30.00	
Uplink data rate	kbps	384.00	
Modulation/Access		QPSK/FDMA	
FEC		Rate-1/2 with Reed-Solomon	
Occupied bandwidth	kHz	500.00	
Uplink required Eb/No	dB	8.00	
Downlink frequency	GHz	20.00	
Downlink data rate	Mbps	90.00	
Modulation/Access		QPSK/TDM	
FEC		Rate-1/2 with Reed-Solomon	
Occupied bandwidth	MHz	114.00	
Downlink required Eb/No	dB	5.00	
Earth terminal antenna	m	0.70	
Uplink budget:	Edge of coverage	Clear sky	Uplink fade
Transmit power	dBW	-0.73	-0.73
Transmit loss	dB	1.00	1.00
Transmit antenna gain	dBi	44.20	49.00
Uplink free space loss	dB	214.00	214.00
Atmospheric loss	dB	0.90	0.90
Rain loss	dB	0.00	9.00
Satellite G/T	dB/K	12.40	12.40
Boltzmann's constant	dBW/K/Hz	228.60	228.60
Bit rate	dBHz	55.84	55.84
Uplink thermal Eb/No	dB	12.73	8.53
Cross-pol Eb/lo	dB	22.00	22.00
Copol Eb/lo	dB	22.00	22.00
Intersystem interference Eb/lo	dB	22.50	22.50
Uplink total Eb/(No+lo)	dB	11.45	8.00
Excess Margin	dB	3.45	0.00
Downlink budget:	Edge of coverage	Clear sky	Downlink fade
Transmit power	dBW	17.78	17.78
Transmit loss	dB	2.00	2.00
Transmit antenna gain	dBi	40.20	40.20
Downlink free space loss	dB	210.00	210.00
Atmospheric loss	dB	0.80	0.80
Rain loss	dB	0.00	6.00
Earth terminal G/T	dB/K	18.00	18.00
Boltzmann's constant	dBW/K/Hz	228.60	228.60
Bit rate	dBHz	79.54	79.54
Downlink thermal Eb/No	dB	12.24	6.24
Cross-pol Eb/lo	dB	22.00	22.00
Copol Eb/lo	dB	22.00	22.00
Intersystem interference Eb/lo	dB	20.00	20.00
Downlink total Eb/(No+lo)	dB	10.84	5.84
Excess Margin	dB	5.84	0.84

Figure 6. Sample Link Budget for 1.544 Mb/s Service using 1.2 m Terminals

On-Board Processing Satellite Link Performance Calculation				
Link parameters:	Unit	Value		
Uplink frequency	GHz	30.00		
Uplink data rate	kbps	1,544.00		
Modulation/Access		QPSK/FDMA		
FEC		Rate-1/2 with Reed-Solomon		
Occupied bandwidth	kHz	2,000.00		
Uplink required Eb/No	dB	8.00		
Downlink frequency	GHz	20.00		
Downlink data rate	Mbps	90.00		
Modulation/Access		QPSK/TDM		
FEC		Rate-1/2 with Reed-Solomon		
Occupied bandwidth	MHz	114.00		
Downlink required Eb/No	dB	5.00		
Earth terminal antenna	m	1.20		
Uplink budget:	Edge of coverage	Clear sky	Uplink fade	
Transmit power	dBW	5.32	5.32	
Transmit loss	dB	1.00	1.00	
Transmit antenna gain	dBi	49.00	49.00	
Uplink free space loss	dB	214.00	214.00	
Atmospheric loss	dB	0.90	0.90	
Rain loss	dB	0.00	9.00	
Satellite G/T	dB/K	12.40	12.40	
Boltzmann's constant	dBW/K/Hz	228.60	228.60	
Bit rate	dBHz	61.89	61.89	
Uplink thermal Eb/No	dB	17.53	8.53	
Cross-pol Eb/lo	dB	22.00	22.00	
Copol Eb/lo	dB	22.00	22.00	
Intersystem interference Eb/lo	dB	22.50	22.50	
Uplink total Eb/(No+lo)	dB	14.45	8.00	
Excess Margin	dB	6.45	0.00	
Downlink budget:	Edge of coverage	Clear sky		Downlink fade
Transmit power	dBW	17.78		17.78
Transmit loss	dB	2.00		2.00
Transmit antenna gain	dBi	40.20		40.20
Downlink free space loss	dB	210.00		210.00
Atmospheric loss	dB	0.80		0.80
Rain loss	dB	0.00		6.00
Earth terminal G/T	dB/K	22.60		22.60
Boltzmann's constant	dBW/K/Hz	228.60		228.60
Bit rate	dBHz	79.54		79.54
Downlink thermal Eb/No	dB	16.84		10.84
Cross-pol Eb/lo	dB	22.00		22.00
Copol Eb/lo	dB	22.00		22.00
Intersystem interference Eb/lo	dB	20.00		20.00
Downlink total Eb/(No+lo)	dB	13.63		9.78
Excess Margin	dB	8.63		4.78

Figure 7. Sample Link Budget for 3.088 Mb/s Service using 1.2 m Terminals

On-Board Processing Satellite Link Performance Calculation				
Link parameters:	Unit	Value		
Uplink frequency	GHz	30.00		
Uplink data rate	kbps	3,088.00		
Modulation/Access		QPSK/FDMA		
FEC		Rate-1/2 with Reed-Solomon		
Occupied bandwidth	kHz	4,000.00		
Uplink required Eb/No	dB	8.00		
Downlink frequency	GHz	20.00		
Downlink data rate	Mbps	90.00		
Modulation/Access		QPSK/TDM		
FEC		Rate-1/2 with Reed-Solomon		
Occupied bandwidth	MHz	114.00		
Downlink required Eb/No	dB	5.00		
Earth terminal antenna	m	1.20		
Uplink budget:	Edge of coverage	Clear sky	Uplink fade	
Transmit power	dBW	8.33	8.33	
Transmit loss	dB	1.00	1.00	
Transmit antenna gain	dBi	49.00	49.00	
Uplink free space loss	dB	214.00	214.00	
Atmospheric loss	dB	0.90	0.90	
Rain loss	dB	0.00	9.00	
Satellite G/T	dB/K	12.40	12.40	
Boltzmann's constant	dBW/K/Hz	228.60	228.60	
Bit rate	dBHz	64.90	64.90	
Uplink thermal Eb/No	dB	17.53	8.53	
Cross-pol Eb/lo	dB	22.00	22.00	
Copol Eb/lo	dB	22.00	22.00	
Intersystem interference Eb/lo	dB	22.50	22.50	
Uplink total Eb/(No+lo)	dB	14.45	8.00	
Excess Margin	dB	6.45	0.00	
Downlink budget:	Edge of coverage	Clear sky		Downlink fade
Transmit power	dBW	17.78		17.78
Transmit loss	dB	2.00		2.00
Transmit antenna gain	dBi	40.20		40.20
Downlink free space loss	dB	210.00		210.00
Atmospheric loss	dB	0.80		0.80
Rain loss	dB	0.00		6.00
Earth terminal G/T	dB/K	22.60		22.60
Boltzmann's constant	dBW/K/Hz	228.60		228.60
Bit rate	dBHz	79.54		79.54
Downlink thermal Eb/No	dB	16.84		10.84
Cross-pol Eb/lo	dB	22.00		22.00
Copol Eb/lo	dB	22.00		22.00
Intersystem interference Eb/lo	dB	20.00		20.00
Downlink total Eb/(No+lo)	dB	13.63		9.78
Excess Margin	dB	8.63		4.78

13. Interference Analysis

The Orion Ka-band all digital satellite network is designed to be compatible with the 2° orbital spacing environment. The earth stations accessing the Orion space segment will meet the established antenna sidelobe performance standard of $29-25\log(\theta)$ dBi.

The following summary of intersystem interference analysis, using representative system parameters, demonstrate that there will be no significant interference problem between two adjacent satellite systems that are spaced at least 2° away from each other.

Interference into Orion Network

Uplink Interference:		
Interfering carrier	Digital SCPC	Analog TV-FM
Bandwidth (MHz)	3.0	26.0
Power flux density (dBW/m ²)	-107	-78
Transmit antenna (m)	1.2	10.0
Sidelobe discrimination (dB)	28	45.5
Interferer spectral power flux density (dBW/m ² /Hz)	-199.7	-197.6
Orion carrier	Digital SCPC	Digital TDM
Bandwidth (MHz)	3.0	114
Power flux density (dBW/m ²)	-111.4	-92.0
Spectral power flux density (dBW/m ² /Hz)	-176.2	-172.6
Orion uplink C/I (dB)	23.5	25.0
Downlink Interference:		
Interfering carrier	Digital SCPC	Analog TV-FM
Carrier EIRP (dBW/carrier)	38.9	53
Sidelobe discrimination (dB)	22	22
Interferer spectral power density (dBW/Hz)	-47.8	-43.1
Orion carrier	Digital SCPC	Digital TDM
Carrier EIRP (dBW/carrier)	36.7	55.5
Spectral power density (dBW/Hz)	-28.1	-25.0
Orion downlink C/I (dB)	19.7	18.1

Orion's BER performance criteria can be met with downlink E_b/N_0 of 5 to 8 dB depending on the error correcting code rates. Therefore, the degradation in link performance due to the intersystem interference is negligible.

Similarly, the interference into an adjacent system is shown as the following:

Interference into Adjacent Satellite System

Uplink Interference:		
Orion carrier	Digital SCPC	Digital TDM
Bandwidth (MHz)	3.0	114
Power flux density (dBW/m ²)	-111.4	-85.0
Transmit antenna (m)	1.2	5.0
Sidelobe discrimination (dB)	28	39.5
Interferer spectral power flux density (dBW/m ² /Hz)	-204.1	-205.0
Adjacent satellite carrier	Digital SCPC	Analog TV-FM
Bandwidth (MHz)	3.0	26.0
Power flux density (dBW/m ²)	-107	-78
Spectral power flux density (dBW/m ² /Hz)	-171.8	-152.1
Adjacent satellite uplink C/I (dB)	32.3	52.9
Downlink interference:		
Orion carrier	Digital SCPC	Digital TDM
Carrier EIRP (dBW/carrier)	36.7	59.5
Sidelobe discrimination (dB)	22	22
Spectral power density (dBW/Hz)	-50.1	-43.0
Adjacent satellite carrier	Digital SCPC	Analog TV-FM
Carrier EIRP (dBW/carrier)	40.9	55
Interferer spectral power density (dBW/Hz)	-23.8	-19.1
Adjacent satellite downlink C/I (dB)	26.3	23.9

The uplink and downlink C/I ratio exceeds 23 dB, and there is no significant intersystem interference.

14. Station Keeping and Antenna Pointing Accuracy

The orbital inclination and longitudinal drift will be maintained within $\pm 0.05^\circ$ of nominal. The Ka-band spacecraft antenna pointing will be maintained within $\pm 0.05^\circ$ of nominal during normal mode of operation, and $\pm 0.1^\circ$ during station keeping maneuvers.

15. Maximum Power Flux Density (PFD)

The maximum EIRP at the center of beam of each transponder channel is 59.5 dBW, which provides the maximum PFD of -102.9 dBW/m² on the ground for an unmodulated carrier. However, all traffic carriers are digitally modulated, and the power flux density in any 1 MHz band, within a 114 MHz transponder, is -123.5 dBW/m² which is at least 8.5 dB below the zero to 5 degrees elevation PFD limits specified by the Commission's rules (47 CFR Section 25.208(c)). Therefore, the maximum downlink PFD is well within the FCC limits.

16. Launch Vehicle

The spacecraft design is compatible with a wide range of available commercial launch vehicles such as Atlas IIAS, Ariane 4/5, Proton, Sea launch, Delta III and Long March. The actual launch vehicle will be selected on a competitive basis.

17. TT&C Arrangement

Orion plans to use an existing TT&C facility that will be located in the Asia Pacific Region. The most likely location for this facility will either Guam or the Marshall Islands. This facility will be connected to the Orion Control Center in Rockville, Maryland.

18. Spacecraft Characteristics

The major characteristics of the ORION F5 spacecraft are given in the table below.

Characteristics of ORION F5 Satellite

Parameter	Characteristics
Spacecraft stabilization:	
Transfer Orbit	3-axis stabilized
On-station	3-axis stabilized
Mission life	13 years
Reliability:	75% of achieving full performance at end of life
Station keeping accuracy	$\pm 0.05^\circ$ E-W and N-S
Antenna pointing accuracy	$\pm 0.05^\circ$ normal
	$\pm 0.1^\circ$ during station keeping maneuver
Eclipse capability	100%
Mass summary:	
Spacecraft dry mass	1550 kg
Propellant	2150 kg
Launch mass	3700 kg
Power summary:	
Spacecraft requirement	6330 W
Solar Array at EOL	7000 W
Solar Array at BOLL	8200 W
Dimension:	
Spacecraft platform	Approx. 2.2 m x 2.2 m x 2.4 m
Solar array wing span	Approx. 26 m

A detailed breakdown of the satellite's mass and power budgets are given in the tables below.

Spacecraft Mass Budget Summary

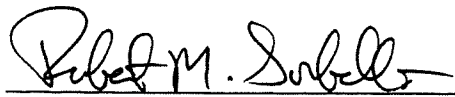
Parameter	Mass
Spacecraft dry mass:	
Communications payload	500 kg
TT&C	50 kg
AOCS	90 kg
Structure	200 kg
Mechanism	90 kg
Propulsion	110 kg
Power (Solar array and batteries)	370 kg
Thermal	90 kg
Others	50 kg
Propellant and pressurant	2150 kg
Total mass:	3700 kg

Spacecraft Power Budget Summary

Parameter	Power
Subsystem:	
Communication payload	5000 W
TT&C	100 W
Attitude & orbit control	110 W
Thermal (Equinox)	350 W
Battery charging	650 W
Other	120 W
Total requirement:	6330 W
Solar array power capability:	
Beginning-of-life (BOL)	8200 W
End-of-life (EOL)	7000 W
Margin at EOL:	670 W

Engineering Certification

I hereby certify that I am the technically qualified person responsible for the preparation of the engineering information contained in the Technical Exhibit of this Application, that I am familiar with Part 25 of the Commission's rules, and that the technical information is complete and accurate to the best of my knowledge.

A handwritten signature in black ink, reading "Robert M. Sorbello", written over a horizontal line.

Robert M. Sorbello, Ph.D.
Director, Systems Engineering
Orion Satellite Corporation

Exhibit No. 2

ESTIMATED CAPITAL REQUIREMENTS

<u>Description</u>	<u>Estimated Costs</u>
Spacecraft, launch and insurance*	\$240 million
TT&C Construction**	\$3 million
Operations (1st year)	\$10 million

* Orion intends to use turnkey arrangements which result in a single, integrated price from the principal spacecraft and launch vendors.

** Modification of existing TT&C facilities

EXHIBIT NO. 3

ESTIMATED DEPLOYMENT SCHEDULE

<u>Description</u>	<u>Date</u>
Commencement of Construction	May 2000
Completion of Construction	July 2002
Launch	September 2002
Placement into Service	October 2002

EXHIBIT 4
OTHER ORION SATELLITE APPLICATIONS AND AUTHORIZATIONS

International Private Satellite Partners LP (d/b/a Orion Atlantic L.P.), of which Orion Network Systems, Inc. is the general partner, holds authorizations for space stations at the following orbital locations:

- (1) 37.5 degrees W.L. (FCC File No. CSS-83-002-P-(M))
- (2) 47 degrees W.L. (FCC File No. CSS-83-002-P-(M) and 204-SAT-ML-95)
- (3) 12 degrees W.L. (FCC File No. CSS-91-009)

Orion Atlantic, L.P. is an applicant for a Ka-Band space station at 15 degrees W.L.

Orion Network Systems - Asia Pacific, Inc. a wholly-owned subsidiary, is an applicant for a space station authorization at 126 degrees E.L. (FCC File No. CSS-94-009);

Orion Network Systems, Inc., is an applicant or holder of an authorization for space stations at the following orbital locations:

- (1) 135 degrees W.L. (File No. CSS-91-009) (Ku-band);
- (2) 89 degrees E.L. (Ka-band) (File Nos. 195-197-SAT-P/LA-95;
205-SAT-AMEND-95);
- (3) 127 degrees W.L. (Ka-band) (File Nos. 74-SAT-P/LA-95;
205-SAT-AMEND-95) (proposed settlement pending for
reauthorization at 67 degrees W.L.);
- (4) 81 degrees W.L. (Ka-band) (File Nos. 195-197-SAT-P/LA-95;
205-SAT-AMEND-95); and

- (5) 78 degrees E.L. (Ka-band) (File Nos. 195-197-SAT-P/LA-95; 205-SAT-AMEND-95).

ORION NETWORK SYSTEMS, INC.

DATE 12/17/97 CHECK NO. 017221 VENDOR KEY FCC

DATE	AMOUNT	DISCOUNT	VOUCHER NO.	NET AMOUNT
12/15/97	1215.00	0.00	018125	1215.00
TOTAL				1215.00



Orion Network Systems, Inc.
 910 Research Blvd. Suite 100
 Rockville, MD 20850-3238
 (301) 258-8101 or (800) 78-ORION

Acct# 716/520

MARYLAND NATIONAL BANK

017221

ONE THOUSAND TWO HUNDRED FIFTEEN AND NO/100 DOLLARS

AMOUNT *****\$1,215.00

Federal Communications Comm.
 Common Carrier International
 P.O. Box 358115
 Pittsburgh, PA 15251

NOT VALID AFTER 60 DAYS

Crane

⑈017221⑈ ⑆052000168⑆ 535209332⑈