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Federal Communications Commission
Office of the Secretary

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March 1, 1991

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

Re: National Exchange Satellite, Inc.

Dear Madam Secretary:

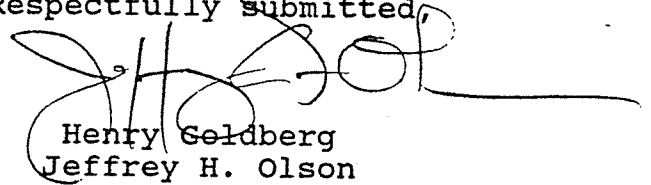
Transmitted herewith on behalf of National Exchange Satellite, Inc. ("NEXSAT") is a redacted copy of a Satellite Purchase Contract ("Contract") among NEXSAT and TRW, Inc. Space Technology Group ("TRW") which provides for the construction of NEXSAT's SpotNet satellite system.

The Contract contemplates the construction of four smaller satellites rather than the two large spacecraft authorized in National Exchange Satellite, Inc., 3 FCC Rcd 6992 (1988), modified, Assignment of Orbital Locations, 5 FCC Rcd 179 (1990). However, in order to confirm the feasibility of this plan, the contract requires that, within the next six months, TRW must complete an in-depth design study of this proposal. Assuming the success of that study, NEXSAT expeditiously will file an application to modify its existing authorizations to conform to the optional spacecraft design settled upon by the parties. In order to facilitate the continued development of the SpotNet system consistent with the Contract, NEXSAT requests that the milestones for construction of the SpotNet satellites be extended to conform to the program schedule set out Exhibit C of the Contract.

Ms. Donna R. Searcy
March 1, 1991
Page 2

If there are any questions regarding this matter, please
contract the undersigned.

Respectfully submitted,



Henry Goldberg
Jeffrey H. Olson

Attorneys for
National Exchange Satellite, Inc.

cc: James R. Keegan, Chief
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Cecily C. Holiday, Chief
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Office of Plans and Policy

Lauren J. Belvin, Legal Advisor
Office of the Chairman

Lewis J. Paper, Esq.

SATELLITE PURCHASE CONTRACT

Between

**TRW Inc.
Space & Technology Group**

and

National Exchange Satellite, Inc.

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SATELLITE PURCHASE CONTRACT

This Satellite Purchase Contract is entered into this 21st day of February, 1991, between the Space & Technology Group of TRW Inc. (hereinafter referred to as "TRW"), an Ohio corporation with offices at One Space Park, Redondo Beach, California, and National Exchange Satellite, Inc. (hereinafter referred to as "NEXSAT"), a Delaware corporation with offices at 1320 Old Chain Bridge Road, McLean, Virginia 22101.

ARTICLE I DEFINITIONS AND PRIORITY

1.1 Definitions

The following words and phrases shall have the meanings set forth below:

"Authorized Representative" means the individual holding the title President of NEXSAT or Manager, Communications Satellite Contracts of TRW, as the case may be, for this Contract or his/her designees under a written delegation of authority communicated in writing to the other party.

"Contract" means this contract between TRW and NEXSAT, including the following Exhibits, attached hereto and made a part hereof:

- A Statement of Work
- B Satellite Performance Specifications
- C Master Schedule
- D Prices
- E Payment Plan
- F Performance Algorithm

"Deliverable Data" means any Technical Data and Information (as defined below) identified in Exhibit A as being deliverable by TRW under this Contract.

"Force Majeure" means any act of God, war, act or failure to act of any government in its sovereign capacity, fire, flood, earthquake, strike, epidemic, quarantine, embargo, nuclear

incident or any other act beyond the reasonable control and without the fault of TRW and its Subcontractors (as defined below), including but not limited to the failure of NEXSAT, and/or its contractors, subcontractors or vendors to perform in a timely manner their responsibilities under this Contract or any other contract for any NEXSAT Purpose related to this Contract.

"Intentional Ignition" means intentional ignition of any first stage engine of the Launch Vehicle (as defined below).

"Launch Vehicle" means a launch vehicle designated by NEXSAT with respect to the Satellite (as defined below) pursuant to Exhibit A.

"NEXSAT Purpose" means any purpose connected with the design, development, construction, establishment, operation, and maintenance of equipment and components for use with the NEXSAT Space Segment (as defined below).

"NEXSAT Space Segment" means the telecommunications satellite, and the tracking, telemetry, command, control, monitoring, and related facilities and equipment owned or leased by NEXSAT and required to support the operation of such satellite.

"Orbital Life" means the satellite design life set forth in Exhibit B.

"Satisfactory Operation" means that the data available from the Satellite (as defined below) demonstrates that the Satellite meets the operational and performance requirements set forth in Exhibit B in all material respects. A Satellite defect that can be satisfactorily corrected by switching to a redundant unit or through gain adjustments in the Satellite shall not be deemed to affect the Satisfactory Operation of the Satellite.

"Satellite" means all of the flight equipment necessary to meet the requirements in Exhibit B, including integration and compatibility with the Launch Vehicle. In the case of any Satellite to be launched via a Launch Vehicle that injects the Satellite into low earth or parking orbit, the term "Satellite" shall include the apogee engine.

"Subcontract" means any subcontract, including purchase orders and all similar forms of agreement at any tier under this Contract.

"Subcontractor" means a contractor under any Subcontract and includes suppliers.

"Successful Injection" means injection of the Satellite into geosynchronous orbit.

"Technical Data and Information" means all data and information including but not limited to technical writings, sound recordings, computer software, pictorial reproductions, drawings, and other graphic representations and works of similar nature, and any other data necessary for the use and operation of the Satellite, whether or not copyrighted, to the extent that such data and information are of the type customarily retained in the normal course of business. The term does not include TRW's or Subcontractor's financial reports, cost analyses, and other data and information incidental to contract administration.

"Work" means all of the equipment to be delivered and the services and activities required to be performed by TRW pursuant to this Contract.

1.2 Priority

In case of any inconsistencies between the text of this Contract and any of the Exhibits, the text of this Contract shall prevail. In the case of any inconsistencies among the Exhibits to this Contract, this Contract shall be interpreted in the same order of priority as the order of its Exhibits.

ARTICLE 2 SCOPE OF WORK

TRW shall provide the necessary personnel, material, equipment, services and facilities to perform the Work specified under the provisions of this Contract.

**ARTICLE 3
TRW DELIVERABLES**

3.1 Equipment

The equipment to be delivered by TRW and the delivery locations are specified in Exhibit A. The mode of delivery shall be by common carrier selected by TRW.

3.2 Documentation

The documentation to be delivered by TRW is specified in Exhibit A. All such documentation is to be delivered to NEXSAT by electronic transmission, air mail, or surface mail, as directed in writing by NEXSAT.

**ARTICLE 4
PERFORMANCE SCHEDULE**

All Work shall be performed in accordance with the master schedule set forth in Exhibit C. Deliverables shall be delivered in accordance with the delivery times specified in Exhibit C.

**ARTICLE 5
PRICES**

The prices for all Work are specified in Exhibit D and shall be paid in accordance with Article 6. These prices include all taxes and other charges associated with the performance of the Work, but are net of sales, use and excise taxes, and duties and taxes imposed by foreign governments. All such taxes and duties, if any, shall be paid by NEXSAT.

ARTICLE 6 PAYMENT TERMS

6.1 Progress Payments

The prices referred to in Article 5 shall be paid by NEXSAT in accordance with Exhibit E and with the terms of this article. Within thirty (30) days after NEXSAT accepts the Design Study report in accordance with Article 17 of this Contract, NEXSAT at its sole expense shall establish and thereafter until termination or expiration of this Contract shall maintain with a commercial banking or other financial institution acceptable to TRW in its sole discretion an irrevocable letter of credit in favor of TRW in the principal amount of the contract price set forth in Exhibit E, as it may be adjusted from time to time pursuant to Articles 18 or 20. The terms of such letter of credit shall be acceptable to TRW in its sole discretion and shall provide for payments to TRW in United States dollars within two (2) days following presentation of a sight draft and an invoice, a copy of which shall have been forwarded to NEXSAT.

6.2 Other Payments by Either Party

With respect to any other amount payable under this Contract, the party entitled to payment shall make written demand therefor, or shall submit an invoice if so requested by the payor, after such entitlement becomes established, and the payor shall make payment within ten (10) days after receipt of the written demand or invoice.

6.3 Manner of Payment

All payments hereunder shall be made by depositing, by bank wire transfer, the required amount (in immediately available funds) in an account designated by the payee for such purpose in the payee's written demand or invoice.

6.4 Late Payment

Late payments by NEXSAT shall be subject to interest at the prime or reference rate as in effect from time to time at a bank to be designated in writing by TRW in its sole discretion,

calculated from the day following the due date until the date of actual payment.

ARTICLE 7 ACCESS TO WORK IN PROGRESS

7.1 Access

Subject to the receipt of any and all required government approvals, if any, and to TRW's and its Subcontractor's rights in Technical Data and Information, the NEXSAT Authorized Representative shall have the right, at all reasonable times and intervals during the performance of this Contract, and upon reasonable notice to TRW, to monitor the Work in progress at the plants of TRW and, to the extent TRW has such right, its Subcontractors.

7.2 NEXSAT Notification of Non-Conformance

If, during the performance of this Contract, the NEXSAT Authorized Representative reasonably determines that any of the Work does not conform to the requirements of this Contract, the NEXSAT Authorized Representative shall promptly notify the TRW Authorized Representative, and confirm such notification in writing within two (2) business days, of the particulars in which the Work does not meet the requirements of the Contract, and TRW shall within a reasonable period of time remedy the defects. The decision as to how to make the corrections shall be in TRW's sole discretion.

ARTICLE 8 FINAL ACCEPTANCE

Upon delivery to NEXSAT of any deliverables under this Contract, the NEXSAT Authorized Representative shall promptly conduct a final inspection of such deliverables or, at NEXSAT's option, witness such inspection by TRW, and shall either accept them in writing or promptly notify TRW in writing of the particulars in which they are unacceptable. If no objection shall have been received by the TRW Authorized Representative within five (5) days of delivery of such deliverables, such deliverables

shall be deemed to have been accepted by NEXSAT. Upon remedy of such particulars to the reasonable satisfaction of the NEXSAT Authorized Representative, such deliverables shall be accepted by NEXSAT in writing. Corrections required to render the deliverables in conformance with this Contract shall be made by TRW at its own cost. The decision as to how to make the corrections shall be in TRW's sole discretion. Any deliverables found to be non-conforming during or after testing required under this Contract shall, at NEXSAT's request and without charge to NEXSAT, be retested by TRW after TRW has remedied the non-conformance. The extent of retesting to be performed shall be determined by TRW in its discretion.

ARTICLE 9 TITLE AND RISK OF LOSS

9.1 Title

With respect to all deliverable Work identified in Exhibit A, TRW warrants to NEXSAT that it shall deliver good title, free and clear from any claim, lien, pledge, mortgage, security interest, or other encumbrances including, but not by way of limitation, those arising out of the performance of the Work.

9.2 Risk of Loss

Unless otherwise provided in this Contract, title to, beneficial ownership of right to possession to and risk of loss in damage to all deliverable equipment, other than specialized tracking telemetry, and command ground equipment, shall pass to NEXSAT upon delivery to the launch site. Title and risk of loss or damage to all deliverable documents and to specialized tracking, telemetry and command ground equipment shall pass to NEXSAT at time of delivery by TRW to NEXSAT.

Neither (i) the time, method, place, or medium of payment provided for herein, or any combination of the foregoing, nor (ii) the manner of consignment provided for, whether to, or to the order of, NEXSAT or its agent, shall in any way limit or modify the rights of TRW as the owner of such equipment, to have control over the right to possession of the equipment until the title thereto passes to NEXSAT as provided for above. The term "F.O.B."

or other commercial abbreviations, if used on any document related to this Contract, shall not be deemed to relate to the time when or the place where the ownership of and responsibility for the equipment is transferred from TRW to NEXSAT.

ARTICLE 10 WARRANTY

10.1 Warranty

Notwithstanding any prior inspection or acceptance by NEXSAT, TRW warrants that all equipment delivered in accordance with Section 3.1 shall be free from any defects in materials or workmanship, and that all services shall be performed in a skillful and workmanlike manner consistent with generally accepted custom and practice in the industry. All equipment and Deliverable Data shall conform in all material respects to the specifications of this Contract. The warranty for all equipment, other than specialized tracking, telemetry, and command ground equipment, shall commence at the time of final acceptance pursuant to Article 8 hereof and shall run until Intentional Ignition, or for a period of one (1) year, whichever occurs first. This warranty for specialized tracking, telemetry and command ground equipment and Deliverable Data shall commence at the time of final acceptance pursuant to Article 8 hereof and shall run for a period of one (1) year.

10.2 Remedies

Subject to the limitations set forth in this Article 10, promptly after receipt of written notice from the NEXSAT Authorized Representative that any equipment is defective or non-conforming, TRW shall either repair or replace any defective or nonconforming equipment or part thereof. The decision whether and how to repair or replace any equipment or part thereof shall be in TRW's sole discretion. With respect to any defects in Deliverable Data, TRW's sole obligation shall be to correct the Deliverable Data at no cost to NEXSAT, and NEXSAT shall have no other remedy against TRW.

10.3 Exclusion

THE WARRANTY IN THIS ARTICLE 10 IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AT LAW OR IN EQUITY, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TRW'S WARRANTY OBLIGATIONS AND NEXSAT'S REMEDIES ARE SOLELY AND EXCLUSIVELY AS STATED IN THIS ARTICLE 10.

10.4 Limitation of Liability

Notwithstanding any other provision in this Contract, in no event shall TRW be liable for any special or consequential damages, including but not limited to damages for loss of revenue, profits, including third-party profits, or contracts, however caused or arising.

10.5 Equitable Relief

Nothing contained in this Contract shall limit NEXSAT's ability to obtain equitable relief to prevent TRW from violating, or to require TRW to perform, its obligations set forth in this Contract.

ARTICLE 11 CORRECTIONS IN UNLAUNCHED SATELLITE

If, at any time prior to Intentional Ignition, TRW, as a result of data with respect to any other satellites, becomes aware that defects exist in a Satellite that TRW reasonably determines would materially and adversely affect the operation of the Satellite, TRW shall take prompt appropriate corrective measures at its own expense to eliminate any such defects from such Satellite. The decision as to how to make the corrections shall be in TRW's sole discretion. If such corrections affect TRW's ability to comply with the delivery schedule referred to in Article 4, NEXSAT and TRW shall agree upon reasonable adjustments to that schedule, provided that such adjustment shall be without penalty to TRW.

ARTICLE 12 RIGHTS IN DELIVERABLE DATA

12.1 Use of Deliverable Data by NEXSAT and Others

TRW hereby grants to NEXSAT an irrevocable, non-exclusive and world wide right to use, and to authorize any third party to use, Deliverable Data for NEXSAT Purposes without payment of additional compensation to TRW. The data rights granted under this Contract shall not survive the termination of this Contract by TRW for the default of NEXSAT and, in such event, all such rights previously granted shall revert to TRW and NEXSAT shall have no rights whatsoever with respect to any and all such Deliverable Data.

12.2 Copyrights in Deliverable Data

If any Deliverable Data furnished pursuant to this Article 12 is copyrighted, and to the extent that TRW now has or hereafter acquires the authority to authorize copying, TRW hereby grants to NEXSAT the royalty-free right to copy such copyrighted material for the purpose of this Article 12, provided that NEXSAT shall apply the appropriate copyright notice to all copies made. If any Deliverable Data furnished pursuant to this Article 12 is copyrighted and TRW is not entitled to authorize copying, notice to that effect shall be given to NEXSAT at the time the material is furnished.

12.3 Other Authorizations

Notwithstanding any other provisions of this Article 12, use of any Deliverable Data shall be free, unconditional, and unlimited to the extent, and from the time, that any such data lawfully comes into the public domain. No other right or license of any nature whatsoever is granted or extended directly or by implication, estoppel or otherwise under this Contract and nothing herein shall imply the granting of a license under any patent.

12.4 Markings

All Deliverable Data furnished pursuant to this Article 12 shall be marked as follows:

"This document contains Deliverable Data furnished pursuant to a Contract between NEXSAT and TRW dated February 21, 1991. Such data may be used only in the manner specified in that Contract, unless the data lawfully comes into the public domain or lawfully becomes available to the user on other terms."

NEXSAT shall be entitled to ignore and remove any other marking, but only after notice and a reasonable opportunity to modify or defend the marking have been given to TRW.

ARTICLE 13 INDEMNIFICATION

13.1 Indemnification by TRW

TRW shall indemnify and hold NEXSAT, its officers, agents, servants, employees, subsidiaries, successors and assigns, or any of them, harmless from any and all loss, damage, liability or expense, resulting from damage to all tangible property and injuries, including death, to all persons (natural or juridical), arising from any occurrence caused by an act or omission of TRW, its Subcontractors or agents, or any of them, in the performance of the Work, except that TRW shall have no obligation to provide indemnification from liabilities caused by the Satellite after Intentional Ignition, and TRW shall at its sole expense defend any claims, actions, suits and proceedings, whether in law or equity, brought against NEXSAT, its officers, agents, servants, employees, subsidiaries, successors and assigns, or any of them, on account thereof, and shall pay all expenses, including reasonable attorneys' fees, and satisfy all judgments as may be incurred by or rendered against them, or any of them, in connection therewith, provided TRW is given prompt notice of any such claim, action, suit or proceeding and provided TRW is given, at TRW's written request and sole expense, such assistance and information as may be reasonably provided by NEXSAT.

13.2 Indemnification by NEXSAT

NEXSAT shall indemnify and hold TRW, its Subcontractors, and their officers, agents, servants, employees, subsidiaries, successors and assigns, or any of them, harmless from any and all

loss, damage, liability or expense, resulting from damage to all tangible property and injuries, including death, to all persons (natural or juridical), arising from any occurrence caused by an act or omission of NEXSAT, its subcontractors or agents, or any of them, in conjunction with this Contract and NEXSAT shall at its sole expense defend any claims, actions, suits and proceedings, whether in law or equity, brought against TRW, its Subcontractors, and their officers, agents, servants, employees, subsidiaries, successors and assigns, or any of them, on account thereof, and shall pay all expenses, including reasonable attorneys' fees, and satisfy all judgments as may be incurred by or rendered against them, or any of them, in connection therewith, provided NEXSAT is given prompt notice of any such claim, action, suit or proceeding and provided NEXSAT is given, at NEXSAT's written request and sole expense, such assistance and information as may be reasonably provided by TRW.

13.3 Launch Site

With respect to loss of or damage to property, or personal injury or death, arising out of activities at the launch site, the parties agree to enter into any standard and customary inter-party waiver of liability that is required in connection with launch site operations and launch services. In addition to any agreements required in connection with launch site operations and launch services, and notwithstanding anything to the contrary in Sections 13.1 and 13.2 above, the parties hereby waive any claims against each other arising out of activities at the launch site, except that risk of loss of or damage to the Satellite shall continue to be governed by Article 9 hereof. To the extent it is not already provided pursuant to agreements with the appropriate launch agency, NEXSAT shall purchase at its cost one or more third party liability insurance policies against the liabilities described in this Section 13.3 naming TRW as an additional named insured on such policy or policies. The liability limits on such insurance shall be no less than One Hundred Million Dollars (\$100,000,000).

ARTICLE 14 FORCE MAJEURE

14.1 Force Majeure

Any party whose ability to perform is affected by a Force Majeure event shall take all reasonable steps to mitigate the impact of such event. If the effect of a Force Majeure event is temporary, the party so affected shall not be responsible for any delay caused by it, and the relevant schedule or time period shall be extended accordingly, if notice is given to the other party within twenty (20) days after the party affected becomes aware, or should reasonably have become aware, that the event has occurred. At the time of the initial notice of the occurrence of the event, or as soon thereafter as possible, the party affected shall inform the other party of the extent of the delay expected as a result of the event and of the actions, if any, proposed to be taken to mitigate the effects of such delay. In the case of Force Majeure events preventing TRW from complying with the schedule for an aggregate period in excess of three hundred and sixty (360) days, either party may declare this Contract to be discharged by giving written notice thereof to the other party. In such event, Section 14.2 shall be applied to determine the impact on TRW and the disposition of the Work affected by the discharge, and TRW shall be entitled to the amounts determined under Section 14.2.

14.2 Termination

In the event of termination of this Contract under Section 14.1, TRW shall promptly submit to NEXSAT a detailed written statement of TRW's total direct and indirect costs incurred in the performance of Work and total direct and indirect cost resulting from such termination as determined in accordance with TRW's Standard Practice Instructions and accounting practices and, if requested by NEXSAT, verified to NEXSAT by TRW's independent auditors at NEXSAT's expense (hereinafter referred to as the "Total Verified Termination Cost"). The termination charges to be paid to TRW by NEXSAT shall be the lesser of one hundred twenty-five percent (125%) of the Total Verified Termination Cost or the Contract Price identified in Exhibit D, less (i) amounts previously paid by NEXSAT pursuant to this Contract, and (ii) amounts representing termination charges

attributable to equipment which TRW or any of its Subcontractors elects to retain. The termination charges shall be paid by NEXSAT within thirty (30) days after receipt of TRW's invoice therefor. In the event of a termination pursuant to this Article 14, all inventory generated under this Contract except that identified pursuant to this Section 14.2 as being retained by either TRW or a Subcontractor shall become the property of NEXSAT.

ARTICLE 15 SATELLITE PERFORMANCE INCENTIVES

15.1 Incentives Related to Achieving Successful Injection

(a) If a Satellite does not achieve Successful Injection, and such failure is caused by the Launch Vehicle or extraneous events not attributable to the Launch Vehicle, the Satellite, or any act or omission of TRW or its Subcontractors, including but not limited to Force Majeure events, TRW shall be entitled to a lump sum payment representing the net present value of the incentive payments provided for in Section 15.2 below, discounted at the prime or reference rate as in effect from time to time at a bank to be designated in writing by TRW in its sole discretion.

(b) If a Satellite does not achieve Successful Injection, and such failure is caused solely by the Satellite or any other act or omission of TRW or its Subcontractors, TRW shall not be entitled to the corresponding incentive payment provided for in Section 15.2 below, provided that if NEXSAT makes commercial use of the Satellite, TRW shall be entitled to, and the parties will negotiate in good faith, an equitable payment for such use. If such failure is attributable in part to the causes specified in Section 15.1(a) and in part to the causes specified in this Section 15.1(b), TRW's entitlement to the corresponding payment and any of the payments provided for in Sections 15.2 and 15.3 shall be negotiated in good faith, with the objective of apportioning TRW's entitlement in accordance with the relative degree to which the causes specified in this Section 15.1(b) contributed to the failure. For the avoidance of doubt, a launch abort after Intentional Ignition shall not constitute failure to achieve Successful Injection.

15.2 Incentives Related to Achieving Satisfactory Operation

With respect to each Satellite that achieves Successful Injection, TRW shall be entitled to performance incentive payments for maintaining Satisfactory Operation as follows:

(a) With respect to each Satellite that achieves Satisfactory Operation, TRW shall be entitled to performance incentives as set forth in Exhibit F.

(b) To the extent that any failure to maintain Satisfactory Operation is caused by extraneous events not attributable to the Satellite or to any act or omission of TRW or its Subcontractors, including but not limited to Force Majeure events and errors by NEXSAT or its other contractors in controlling the Satellite, TRW's entitlement to performance incentives shall not be affected.

(c) To the extent that any failure to maintain Satisfactory Operation is caused solely by the Satellite or any other act or omission of TRW or its Subcontractors (any such Satellite that fails to maintain Satisfactory Operation is hereinafter referred to as a "Degraded Satellite"), TRW shall be entitled only to those incentive payments for the Satellite that correspond to the period that the Satellite maintained Satisfactory Operations.

15.3 Partial Utilization

With respect to any Degraded Satellite subject to Section 15.2(c), if NEXSAT uses the Degraded Satellite for commercial purposes, the parties shall in good faith negotiate equitable adjustments in the applicable amount specified in Section 15.2(a) taking into account the operating usefulness to NEXSAT of the Degraded Satellite with the deficiencies compared to the operating usefulness without the deficiencies, and any additional costs NEXSAT may incur and any revenue it may lose as a result of the failure of the Degraded Satellite to meet continuously the conditions prescribed for Satisfactory Operation.

15.4 Termination of Use

If NEXSAT elects not to use a Degraded Satellite, for any commercial purpose, TRW shall not be entitled to any applicable incentive payments prospectively from the time NEXSAT reasonably terminates use of the Degraded Satellite. Use of a Degraded Satellite for any revenue producing purposes, including but not limited to sale or lease of capacity on the Degraded Satellite to third parties, shall be deemed utilization for commercial purposes. If, after terminating the use of the Degraded Satellite, NEXSAT subsequently decides to use the Degraded Satellite for commercial purposes, the parties shall in good faith negotiate revised performance incentives.

15.5 Verification of Use

TRW shall have the right, at all reasonable times and upon reasonable notice to NEXSAT, to monitor Satellite performance at NEXSAT's facilities for purposes of verification of TRW's right to performance incentive payments hereunder.

15.6 Payment

TRW's entitlement to performance incentive payments under this Article 15 shall arise at the end of each calendar month.

15.7 Exclusivity of Remedies

The remedies in this Article 15 shall be NEXSAT's exclusive remedies with respect to the performance of each Satellite after it is launched, and shall be in lieu of any other remedies at law, in equity, or under this Contract.

ARTICLE 16 TERMINATION FOR DEFAULT

16.1 Termination by NEXSAT

NEXSAT may, by written notice issued by NEXSAT's Authorized Representative, terminate this Contract, in whole or in part, if TRW fails (i) to deliver the Satellite within one hundred eighty (180) days after the date for delivery set forth in

Exhibit C; (ii) to comply in any material respect with any of the provisions of this Contract; or (iii) to make progress so as to ensure completion of this Contract in accordance with its terms and, in each case, fails to take reasonable measures to cure such failure within sixty (60) days from the date of Contractor's receipt of written notice thereof from NEXSAT's Authorized Representative, setting forth in detail NEXSAT's basis for termination of the Contract. If NEXSAT terminates TRW's right to proceed, TRW shall pay any reasonable increased costs to NEXSAT occasioned by such delay in completing the Work subject to the limitations stated in Article 19 .

16.2 Limitation

The rights and remedies of NEXSAT provided in this Article 16 are in lieu of any other rights and remedies provided at law, in equity, or under this Contract.

16.3 Termination by TRW

TRW may, by written notice to NEXSAT's Authorized Representative, terminate this Contract if NEXSAT fails (i) to pay TRW any amounts when due and payable hereunder and fails to cure such failure within fifteen (15) days; or (ii) to perform any other material obligations required to be performed by it under any provision of this Contract and fails to take reasonable measures to cure such failure within thirty (30) days from the date of NEXSAT's receipt of written notice thereof from TRW's Authorized Representative. In the event of termination of this Contract by TRW for NEXSAT's default as provided for hereinabove, TRW shall be entitled to all rights and remedies provided at law, in equity, or under this Contract.

ARTICLE 17 DESIGN STUDY AND OPTION TO TERMINATE

As set forth in greater detail in Exhibit A, TRW shall complete a design study of the payload architecture and conceptual design of NEXSAT's proposed spot beam transponders and satellite. This study shall define the requirements and constraints of this design, develop concepts for fixed and switched service, and assess the overall technology risk of the

project. The total design study effort shall not exceed [redacted] and is to be performed in increments to be agreed upon in writing by the parties. A final written report of this study shall be provided to NEXSAT within six (6) months of the date of this Contract. NEXSAT shall have twenty-one (21) days after its receipt of the final report to accept or reject it in its sole discretion. If rejected, NEXSAT shall so notify TRW in writing and, upon such notification, this Contract shall be terminated without any further action by either party. In the event of such termination, NEXSAT's sole obligation shall be to pay in full all direct and indirect costs incurred in the performance of the Work as determined in accordance with TRW's Standard Practice Instructions and accounting practices through the date of notice to TRW of such termination.

ARTICLE 18 CHANGES

18.1 Changes Requested by TRW

(a) Any changes requested by TRW during the performance of this Contract, within the general scope of this Contract, which would add or delete Work, affect the design of the Satellite, change the method of shipment or packing, or place or time of delivery, or would affect any other requirement of this Contract, shall be submitted in writing to NEXSAT sixty (60) days prior to the proposed date of the change. If such TRW requested change causes an increase or decrease in the total price of this Contract, TRW shall submit to NEXSAT at the time the requested change is submitted, or at a later date agreed to by NEXSAT, the details of such increase or decrease.

(b) NEXSAT shall notify TRW in writing within thirty (30) days after receipt of the requested change and price adjustment, if any, whether or not it agrees with and accepts such change. If NEXSAT agrees with and accepts TRW requested change, TRW shall proceed with the performance of the Contract as changed and an amendment to the Contract reflecting such change, and price adjustment, if any, shall be issued. TRW shall, within a reasonable time thereafter, provide updated information which reflects the final agreed price of the change. In the event the parties are unable to reach agreement on a TRW requested change,

or price adjustment, if any, or both, TRW shall proceed with the performance of the Contract, as unchanged.

18.2 Changes Requested by NEXSAT

Any changes requested by NEXSAT during the performance of this Contract, within the general scope of this Contract, which would add or delete Work, affect the design of the Satellite, change the method of shipment or packing, or place or time of delivery, or would affect any other requirement of this Contract, shall be submitted in writing to TRW. TRW shall respond to a NEXSAT requested change in writing within thirty (30) days after receipt of such request. If such NEXSAT requested change causes an increase or decrease in the total price of this Contract, TRW shall submit to NEXSAT at the time the response to the requested change is submitted, the details of such increase or decrease. NEXSAT shall notify TRW in writing, within thirty (30) days after receipt of TRW's response, whether or not it agrees with and accepts TRW's response. If NEXSAT agrees with and accepts TRW's response, TRW shall proceed with the performance of the Contract as changed and an amendment to the Contract reflecting such change, and price adjustment, if any, shall be issued. TRW shall, within a reasonable time thereafter, provide updated information which reflects the final agreed price of the change. If the change results in an increase to the total Contract price, NEXSAT shall increase the principal amount of the letter of credit provided pursuant to Section 6.1 to include the amount of such price increase. In the event the parties are unable to reach agreement on an NEXSAT requested change, or price adjustment, if any, or both, TRW shall proceed with the performance of the Contract as unchanged.

ARTICLE 19 LIMITATION OF LIABILITY

In the event that TRW shall default in the performance of its obligations under this Contract, the total liability of TRW on any claim, whether in contract, tort (including sole or concurrent negligence) or otherwise, arising out of, connected with, or resulting from the Work to be performed by TRW hereunder shall not exceed Two Million Dollars (\$2,000,000). In no event shall TRW be liable for any special or consequential damages,

including, but not limited to, damages for loss of revenue, profits, including third-party profits, or contracts, however caused or arising.

ARTICLE 20 OPTIONS

If NEXSAT elects by written notice to TRW no later than twelve (12) months after the date of this Contract, TRW shall provide to NEXSAT mission operations support services as provided in paragraph 8.0 of Exhibit A. The price for such services shall be as specified in Exhibit D.

ARTICLE 21 SATELLITE NOT LAUNCHED WITHIN SIX MONTHS

If a Satellite is not launched within six (6) months after final acceptance under Article 8 and is subsequently ordered by NEXSAT to be launched, the Satellite shall be returned, at NEXSAT's sole expense, to TRW's facility in Redondo Beach, California for inspection and refurbishment. The cost of such inspection and refurbishment, plus a reasonable profit to TRW, shall be paid by NEXSAT, unless the delay in launch is caused solely by TRW's gross negligence. All charges to return the Satellite to the launch site shall be borne by NEXSAT.

ARTICLE 22 MISCELLANEOUS

22.1 Headings

The headings and titles to the articles, sections and paragraphs of this Contract are intended for convenience only and shall not be deemed a part hereof or affect the construction or interpretation of any provision hereof.

22.2 Law and Venue

All questions concerning the validity and operation of this Contract shall be governed by and construed in accordance with

the laws of the State of California applicable to contracts entered into and wholly to be performed in the State of California. NEXSAT and TRW agree that any action which, in whole or in part, in any way arises under this Contract shall be brought in the United States District Court for the Central District of California and each hereby submit to the exclusive jurisdiction and venue of such court for purposes of any such action and agree that any notice, document or complaint in any such action may be served on it by delivery to the addresses identified in Section 22.7 below.

22.3 Assignment

This Contract may not be assigned, in whole or in part, by either party without the prior written consent of the other party, which shall not be unreasonably withheld, except that, without securing such prior consent, either party shall have the right to assign the Contract to any company controlling, controlled by or under common control with such party or to any successor of such party by way of merger or consolidation or the acquisition of all or substantially all of the assets of such party relating to the subject matter of this Contract, provided that such successor shall expressly assume all of the obligations of the assignor under this Contract.

22.4 Duty Drawback

If requested by TRW, NEXSAT shall take all reasonable efforts to assist in obtaining authorization for duty-free import of non-U.S. goods to be installed on the Satellite. Such assistance shall include but not be limited to providing such documents, executed by NEXSAT if required, relating to the export of the Satellite from the United States as may be required to enable TRW to pursue duty free import of or duty drawback on the Satellite or its components. Such documents may include properly completed and signed U.S. Customs forms and copies of applicable launch reports, airway bills and bill of lading, as well as written authorization to TRW to make entry and receive and retain duty drawback on the Satellite and identifying the Satellite and the date of export from the United States.

22.5 Export Laws

This Contract and the parties obligations hereunder are subject to all United States laws and regulations relating to exports and to all administrative acts of the United States Government pursuant to such laws and regulations.

22.6 Public Release of Information

Each party shall obtain the prior written approval of the other concerning the content and timing of news releases, articles, brochures, advertisements, prepared speeches, and other information releases proposed to be made by such party concerning this Contract or the Work performed or to be performed hereunder. Such other party shall be given a reasonable time to review the proposed text prior to the date scheduled for its release.

22.7 Notices

All notices, reports, invoices and other correspondence to be provided pursuant to this Contract shall be in writing and shall be effective upon delivery if delivered in person or by facsimile or sent by registered airmail as follows:

If to TRW: TRW Inc.
Space & Defense Sector
Space & Technology Group
One Space Park
Redondo Beach, California 90278
Attention: Manager, Communications
Satellite Contracts
Space & Technology Group

If to NEXSAT: National Exchange Satellite Inc.
1320 Old Chain Bridge Road
McLean, Virginia 22101
Attention: President

or to such other address and to the attention of such person as may be designated in writing to a party's Authorized Representative by the other party's Authorized Representative from time to time.

22.8 Time Limits

Unless otherwise indicated, any time limits to which this Contract binds TRW or NEXSAT shall be counted in calendar days from the day following that of the event marking the start of the time limit, and shall end on the last day of the period specified. When the last day of a time limit is a Saturday or Sunday, or a legal holiday in the country in which the particular contractual performance is required, such time limit shall be extended to the first working day following.

22.9 Confidentiality

Except as a party's Authorized Representative may otherwise consent in writing, neither party shall disclose at any time to any third party Technical Data and Information which was disclosed to such party by the other party in connection with this Contract. The foregoing obligation shall not be applicable to Technical Data and Information which such party can establish was already in or comes into such party's lawful possession independent of disclosures in connection with this Contract.

22.10 Entire Agreement

This Contract constitutes the entire agreement between the parties with respect to the subject matter hereof, and supersedes all prior or contemporaneous correspondence, representations, proposals, negotiations, understandings, or agreements of the parties, whether oral or written. The parties also hereby acknowledge that there are no collateral contracts between them with respect to the subject matter hereof.

22.11 Severability

Any provision hereof prohibited by or unlawful or unenforceable under any applicable law of any jurisdiction shall as to such jurisdiction be ineffective without affecting any other provision of this Contract. To the full extent, however, that the provisions of such applicable law may be waived, they are waived, to the end that this Contract be deemed to be a valid and binding agreement enforceable in accordance with its terms.

22.12 Subcontracts

TRW may subcontract all or any part of its obligations hereunder without the consent of NEXSAT.

22.13 Waiver

No waiver of any right or remedy in respect of any occurrence or event on one occasion by either party hereto shall be deemed a waiver of such right or remedy in respect of such an occurrence or event on any other occasion by such party.

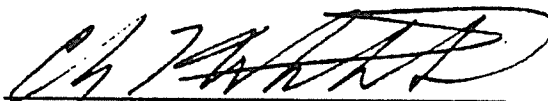
22.14 Counterparts

This Contract may be signed in one or more counterparts which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have executed this Contract.

NATIONAL EXCHANGE SATELLITE, INC.

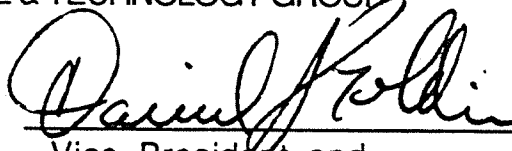
By:



President

TRW INC.
SPACE & TECHNOLOGY GROUP

By:



Vice President and
General Manager

Statement of Work for NEXSAT

1.0 Scope

This Statement of Work defines the tasks and deliverables required as part of the National Exchange Satellite (NEXSAT) program. The NEXSAT program shall include the following elements:

- 1) Separately priced design study to develop payload architecture and satellite conceptual design for a space-switched communications network.
- 2) Four complete communications satellites designed in accordance with satellite specifications provided by TRW and agreed to by TRW and the NEXSAT procurement agency.
- 3) Launch vehicle integration including analytical integration and coordination with the launch vehicle contractor.
- 4) Separately priced launch services and mission operations support including:
 - Shipment (including insurance) of the tested satellites to the launch site together with test gear required for pre-launch checkout.
 - Launch support at the launch site for activities prior to, during, and after the launch.
 - Mission operations support from launch through insertion into geostationary orbit.
 - On-orbit acceptance test support
- 5) Separately priced TT&C facility support including:
 - System engineering support to define hardware and software necessary to perform the tracking, telemetry and command functions for mission operations.
 - Specialized TT&C equipment for the TT&C ground station.
 - TT&C facility acquisition and integration.
- 6) Option for long term on-station support to operate the satellites.

2.0 Deliverable Documentation

Deliverable data and documentation provided by TRW shall be as defined in the Data Requirements List (TBD).

3.0 Design Study. TRW shall perform a design study to define payload architecture and satellite conceptual design. This study shall consist of tasks to define requirements and constraints, develop fixed service concepts, develop switched service concepts, and assess technology risk.

3.1 Requirements/Constraints Definition. Traffic characteristics will be developed in coordination with the NEXSAT procurement agency. Overall payload configurations will be developed. Satellite conceptual designs will be developed.

3.2 Fixed/Trunk Service Concept Definition. Fixed/trunk service concepts will be developed. Connectivity approaches will be developed. Performance, power and weight estimates will be prepared.

3.3 Switched/Customer Premise Service Concept Definition. Switched service concepts will be studied. Performance, power and weight estimates will be prepared.

3.4 Technology/Risk Assessment. Implementation of the transmit and receive subsystems will be studied, considering available and near term technology.

3.5 Study Documentation. A final report will be prepared in accordance with item TBD of the Data Requirements List to document the results and recommendations of the design study.

4.0 Satellites. TRW shall furnish four satellites in accordance with the satellite specifications. The satellites shall provide "SpotNet K" beams configured for business users in information industries, and "SpotNet C" beams configured for general purpose communications. The satellites shall be capable of being launched in a dual mode configuration on the Long March 2E or a shared launch configuration on the Ariane 44L. The baseline launch vehicle shall be the Long March and shall be procured by National Exchange. These satellites shall be manufactured under the terms of the contract between the parties.

5.0 Launch Vehicle Integration. TRW shall be responsible for coordination with the launch vehicle contractor and the provision to the launch vehicle contractor of necessary data for, and all engineering resulting from, the coupled loads and coupled thermal analyses.

6.0 Launch Services and Mission Operations Support.

6.1 Launch Services.

Logistics and Shipping. TRW shall provide the necessary logistics support and shipment (including insurance) to the Satellite Launch Center of the satellite together with all test gear required for pre-launch checkout.

Launch Base Support. TRW shall provide a launch support team at the Satellite Launch Center to accomplish the tasks required prior to, during, and after the launch.

Launch Operations Rehearsals. TRW will have appropriate personnel at all rehearsals for launch operations held prior to launch at various times and places as designated by the launch vehicle contractor.

6.2 Mission Operations Support

Orbital Operations Support Documentation. Documentation shall be in accordance with Items TBD of the Data Requirements List.

Orbital Operations Training. TRW shall furnish orbital operations training, including the necessary training materials, to the staff of the satellite TT&C ground control station. This training shall commence between launch minus 4 months and the launch of each satellite and shall be completed by launch.

Transfer Orbit Operations Support. TRW shall provide tracking, telemetry and command facilities to support transfer orbit operations. TRW provide the communications network which will connect these facilities to the satellite ground control station. During

the transfer orbit operations, TRW will have sufficient staff to handle all satellite and orbital related matters. This staff shall be at a satellite TT&C ground control station.

Post Launch Activities. TRW shall provide personnel, operational procedures, operational commanding plans, and documentation necessary to support acquisition of satellite telemetry and orbit data, performance of necessary calculations and analysis, and generation of the necessary commands to take the satellite from geostationary transfer orbit to the specified orbit. This support shall be furnished at the satellite TT&C ground control station. TRW shall provide the procedures and operational commanding plans, and support performance of all maneuvers required to make satellite operational (e.g., solar panel deployment, antenna deployment, etc.); control satellite during drift operations; stop the satellite at its required orbital location; and perform all other necessary tests on the satellite.

In-Orbit Acceptance Test Support. TRW shall perform, in association with National Exchange representatives, in-orbit checkout of all satellite bus systems (non-payload) during drift to final orbit location. Once on station, TRW shall perform, in association with NEXSAT procurement agency representatives, in-orbit checkout of all communications systems. All testing shall be in accordance with test plans prepared and submitted by TRW and approved by the NEXSAT procurement agency. The final communications performance checkout shall take place at the NEXSAT teleport in TBD. All in-orbit acceptance tests shall be completed within a 30 day period from the time of injection into the geostationary drift orbit.

7.0 TT&C Facility Support

7.1 TT&C Ground Control Station Definition. TRW shall provide system engineering support to define TT&C facilities to operate the National Exchange satellites from a ground station at an East Coast location chosen by National Exchange. This facility shall include all hardware and software necessary to perform the TT&C functions including normal stationkeeping operations. The equipment shall include tracking antennas, receivers, and transmitters. Specialized TT&C equipment as defined in Paragraph 6.3 below shall be provided for baseband signal compatibility between the ground station and the satellites. A TT&C ground control station specification shall be prepared in accordance with item TBD of the Data Requirements List.

7.2 TT&C Facility Acquisition and Integration. TRW shall provide assistance to National Exchange in establishing a TT&C ground control station facility to operate the NEXSATs at an East Coast location chosen and acquired by National Exchange. This assistance shall consist of acquiring and integrating the hardware and software defined in Paragraph 7.1 above into sites and buildings provided by National Exchange. TRW shall assist National Exchange in obtaining the licences and permits necessary for the construction and operation of the TT&C ground control facility.

7.3 Specialized TT&C Equipment. TRW shall furnish TT&C equipment necessary to operate the satellite from the TT&C ground control station. This equipment shall consist of two command encoders and two telemetry demodulating systems. Documentation shall be in accordance with Item TBD of the Data Requirements List.

8.0 Option for Long Term On-Orbit Operational Support. Following the injection into the specified geostationary orbit, TRW shall provide long term on-orbit support to operate the satellites and the TT&C ground stations through a contract separate from the satellite procurement contract.

SATELLITE SPECIFICATION

NATIONAL EXCHANGE SATELLITE

1.0 INTRODUCTION

1.1 SCOPE

This specification establishes the launch, deployment, operation, design, development and verification requirements for National Exchange Satellite (NEXSAT).

1.2 SATELLITE DESCRIPTION

NEXSAT is a geosynchronous communication satellite for the transmission of audio, video, and data signals.

The communications payload consists of transponders which relay signals within the continental United States and provide relay service to Hawaii and Alaska. Signals are between NEXSATs and ground terminals at C-Band and Ku-Band.

2.0 APPLICABLE DOCUMENTS

The specification tree, Figure 2.XX, shows the relationship of this specification to other project specifications.

The following documents of the exact issue indicated form a part of this specification to the extent specified herein. In the event of conflict between documents referenced herein and the detailed content of this specification, the requirements provided herein shall govern.

2.1 SPECIFICATIONS

TBS

2.2 OTHER PUBLICATIONS

TBS

3.0 REQUIREMENTS

System level requirements which control the design of NEXSAT are contained in this specification. Detailed requirements of implementation are contained in lower level specifications identified on the specification tree indicated in Section 2.0.

3.1 SATELLITE DEFINITION

The satellite is shown in the deployed configuration in Figure 3.XX. One of the deployable antennas provides for the C-Band transmit and receive services. The other deployable antenna provides for Ku-Band transmit and receive services. The body-fixed omni antenna provides for Ku-Band tracking, telemetry and command services.

The satellite functions are allocated to the following subsystems:

- a. Communications - Consists of the communications antennas and transponders for C-Band and Ku-Band transmit and receive services.
- b. Tracking, Telemetry and Command - Consists of the antenna, transponder, and processing equipment required for reception and distribution of ground commands to control NEXSAT, formatting and transmission of NEXSAT telemetry data, and to provide ranging.
- c. Attitude Control - Consists of the electrical and electromechanical equipment required to determine satellite attitude in the transfer and operational orbits, to provide satellite attitude control and stabilization, and to provide solar array pointing.
- d. Propulsion - Consists of the equipment and propellants to provide the impulse for geosynchronous orbit injection, velocity adjustments, stationkeeping, and satellite momentum management.
- e. Electrical Power and Distribution - Consists of the equipment required to generate, store, control and distribute electrical power to all satellite subsystems. The solar array substrates and deployment mechanisms are included in this subsystem.
- f. Structure - Consists of the satellite primary and secondary structures, antenna deployment mechanisms, and retention/release devices.
- g. Thermal Control - Consists of thermal control materials, heaters, and thermistors required to maintain satellite equipment within allowable temperature ranges.

3.2 MISSION REQUIREMENTS

3.2.1 LAUNCH AND INJECTION

NEXSATs shall be designed for launch and injection into geosynchronous transfer orbit as a dual launch payload by the Long March 2E or as a secondary payload by the Ariane 44L. The primary launch vehicle shall be the Long March 2E. NEXSAT shall be injected into a geosynchronous orbit with a propulsion system integral to the satellite.

3.2.2 ORBIT LOCATION

NEXSATs shall be located at 127 and 93 degrees West Longitude in geosynchronous equatorial orbits.

3.2.3 STATIONKEEPING

The satellites shall be maintained at their orbital locations with ± 0.1 degree East/West and ± 0.1 degree North/South.

3.2.4 ECLIPSE OPERATION

The satellites shall provide for full eclipse operation.

3.2.5 COMMUNICATIONS REOUREMENTS

3.2.5.1. C-BAND SERVICES

The satellites shall provide "SpotNet C" services with beams configured for general purpose communications. Services shall include:

High-traffic density, point -to-point trunking

Nationwide, one-way distribution services (point to multipoint)

Teletext

Electronic mail

Analog video and audio

Backup service to "SpotNet K" during periods of high rainfall

Coverage shall be provided with the following beams:

Continental Beam : serves continental United States from both 127 degrees and 93 degrees West longitude

Hawaii Beam: serves Hawaii from 127 degrees West longitude with a spot beam

Alaska Beam: serves Alaska from 127 degrees West longitude with a spot beam

3.2.5.1.1 C-BAND DOWNLINK CHARACTERISTICS

EIRP for the three C-Band transmission beams shall be:

Continental Beam: TBD dBW at 3dB coverage (TBR)

Hawaii Spot Beam: TBD dBW at beam center

Alaska Spot Beam: TBD dbW at beam center

The C-Band beam patterns shall be as shown in Figure 3.XX.

3.2.5.1.2 C-BAND UPLINK CHARACTERISTICS

G/T and SFD for the three C-Band uplink beams shall be:

Continental Beam: G/T shall be TBD dB/deg K. SFD shall be TBD W/m^2 .

Hawaii Spot Beam: G/T shall be TBD dB/deg K. SFD shall be TBD W/m^2

Alaska Spot Beam: G/T shall be TBD dB/deg K. SFD shall be TBD W/m^2

The electrical connectors, cabling, and circuit characteristics for the NEXSAT/launch vehicle interfaces shall be as defined in the Electrical Interface Control Drawing, ICD-XXXX.

3.3.1.2 ADAPTER AND SEPARATION SYSTEM

The NEXSAT-to-launch vehicle adapter and the Satellite-to-adapter separation system shall be provided by the launch vehicle (TBR). The interface mounting/attachment holes shall be located with an launch vehicle contractor approved master tooling gauge.

3.4. RELIABILITY AND LIFE

3.4.1 OPERATING LIFE

The Satellite shall have a design life of not less than 10 years. The design life estimate shall accommodate all identifiable wearout factors such as battery and solar array degradation so that specified performance can be maintained for 10 years subsequent to location of the Satellite at its initial longitudinal station. The Satellite design shall also consider all equipment operating times including those that occur as factory operating tests.

3.4.2 SINGLE POINT FAILURE

To the extent practicable, the design shall preclude any single point failure mode that could cause mission failure or hazardous safety conditions. Where feasible, current limiting or power disconnect shall be provided to protect all subsystems from short circuits occurring in any active component of any subsystem. Failure isolation shall be provided for all components within each subsystem.

3.4.3 REDUNDANCY

Redundancy shall be utilized in the design of the Satellite to ensure compliance with the single point failure requirements of Paragraph 3.4.2. Capability for test verification of electronic component redundancy is required.

Specific redundancy requirements are:

The C-Band transponders shall utilize 7 for 6 redundancy.

The K_u-Band transponders shall utilize 10 for 8 redundancy.

The K_u-Band command receivers shall utilize 2 for 1 redundancy

Antenna and solar array release and deployment mechanisms shall incorporate redundant devices.

3.5 TRANSPORTABILITY

The satellite shall be transportable on existing commercial aircraft. Provision shall be made for control of the temperature and humidity of the atmosphere surrounding the satellite during transportation.

3.6 PHYSICAL CHARACTERISTICS

3.6.1 STOWED ENVELOPE

The NEXSAT stowed dimensions shall be compatible with the launch vehicle envelope shown in Figure 3.X.X.

3.6.2 DEPLOYED ENVELOPE AND FIELDS OF VIEW

The NEXSAT deployed configuration is shown in Figure 3.XX.

3.6.3 COORDINATE DEFINITIONS

Figure 3.XX defines the satellite coordinate frame X,Y,Z centered at the satellite center of mass, along with the sign conventions of the attitude determination sensors. In the stowed configuration, the Z-axis points forward with respect to the launch vehicle. During normal on-orbit operation, the +X or roll axis is parallel to the orbital velocity vector and lies within the orbital plane, the +Y or pitch axis is perpendicular to the orbit plane, pointing south, and the + Z or yaw axis points to nadir.

3.7 MASS PROPERTIES

The NEXSAT launch weight, excluding the NEXSAT/launch vehicle adapter shall not exceed 3200 lb (TBR).

The NEXSAT center of gravity shall be located within a ___ inch diameter, ___ inch long cylinder centered at launch vehicle station___ (NEXSAT station ___) along the launch vehicle centerline.

3.8 DESIGN AND CONSTRUCTION

3.8.1 PARTS, MATERIALS, AND PROCESSES

Parts, Materials and Processes (PM&P) shall be selected to meet the requirements of NEXSAT as specified in the NEXSAT Product Assurance Plan, XXXX.

3.8.2 ELECTROMAGNETIC COMPATIBILITY

The satellite and its components shall be designed for compliance with SR1-XX, Electromagnetic interference and Susceptibility Requirements and Test Methods and the NEXSAT/Launch Vehicle Interface Control Document, ICD-XXXX

3.8.3 WORKMANSHIP

All configuration items and components and parts thereof shall be constructed, finished, and assembled in accordance with the workmanship requirements of NEXSAT Product Assurance Plan, XXXX.

3.8.4 SAFETY

3.8.4.1 SYSTEM SAFETY

Prior to flight, the satellite design must receive launch vehicle contractor safety certification for flight by demonstrating conformance with launch vehicle contractor flight safety requirements and ground processing requirements.

Flight safety design shall be implemented in accordance with the NEXSAT Safety Plan, XXXX.

3.8.4.2 RANGE SAFETY

The satellite design, supporting equipment, and procedures used in prelaunch activities shall adhere to all launch vehicle contractor pad safety, range safety, and handling and transport safety requirements. Implementation shall be in accordance with the NEXSAT Safety Plan, XXXX.

3.9 ENVIRONMENTAL DESIGN REQUIREMENTS

The satellite and its components shall be designed to achieve their specified performance requirements during and /or subsequent to exposure to the applicable environments specified in EV1-XX and EV2-XX.

4.0 QUALITY ASSURANCE PROVISIONS

4.1 EQUIPMENT QUALITY ASSURANCE

The equipment shall be fabricated and inspected in accordance with quality assurance requirements as defined in the NEXSAT Product Assurance Plan, XXXX.

4.2 NEXSAT/LAUNCH VEHICLE INTERFACE VERIFICATION

NEXSAT/launch vehicle electrical and mechanical interfaces shall be verified in accordance with the interface verification requirements of the NEXSAT/Launch Vehicle Interface Control Document, XXXX.

4.3 REQUIREMENTS VERIFICATION

4.3.1 VERIFICATION REQUIREMENTS

Performance shall be verified according to the NEXSAT Satellite Factory Test Plan, XXXX, the NEXSAT On-Orbit Test Plan, XXXX, or use of existing test data.

4.3.2 VERIFICATION METHODS

The requirements of Section 3 shall be verified by one or a combination of the following methods: inspection, analysis, demonstration, similarity, and test.

4.3.2.1 TEST

Test shall be accomplished by development, qualification, protoflight, and/or acceptance tests. Test are performed on unit, subsystem, satellite, and on-orbit levels of assembly.

4.3.2.2 ANALYSIS

The analysis method shall consist of review of analytical data resulting from analysis performed by generally recognized techniques. This method is used primarily for requirements that cannot be readily demonstrated through physical testing.

4.3.2.3 INSPECTION

Inspection shall consist of a formal Quality Assurance physical inspection or audit of a deliverable article to ensure compliance with requirements. Requirements shall also be verified by design inspection or design review by an appropriate review authority and documented in a compliance report.

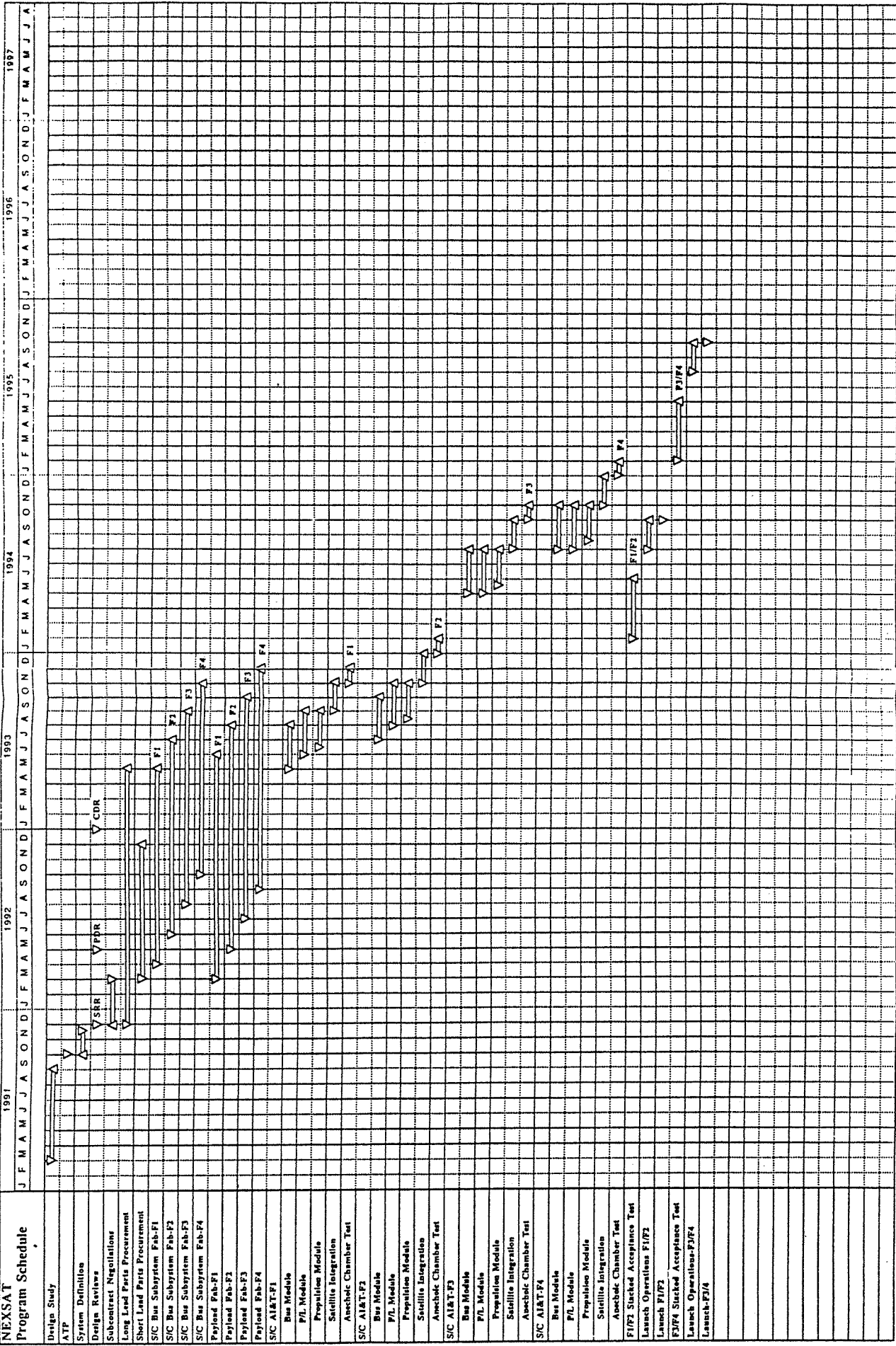
4.3.2.4 DEMONSTRATION

A demonstration shall consist of a special one-time functional test to verify those requirements for which repetitive functional testing is unnecessary or not feasible.

4.3.2.5 SIMILARITY

Similarity shall be used to verify requirements which have been previously satisfied and documented on similar or identical designs.

EXHIBIT C



F4 Jan 25 1991

EXHIBIT D

PRICES

[redacted]

4 SATELLITE PAYMENT PLAN			
YEAR	MONTH	AMOUNT	CUMULATIVE AMOUNT

11-Feb-91

[redacted]

SOW 6.1

LAUNCH SERVICES: SAT 1 & 2	
AMOUNT	CUMULATIVE AMOUNT

[redacted]

SOW 6.1

LAUNCH SERVICES: SAT 3 & 4	
AMOUNT	CUMULATIVE AMOUNT

[redacted]

SOW 6.2

MISSION OPS SUPRT: SAT 1 & 2

AMOUNT	CUMULATIVE AMOUNT
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[redacted]

SOW 6.2

MISSION OPS SUPRT: SAT 3 & 4

AMOUNT	CUMULATIVE AMOUNT
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[redacted]

SOW 7.1

TT&C GROUND STATION DEFNTN	
AMOUNT	CUMULATIVE AMOUNT

[redacted]

SOW 7.2

TT&C FACILITY ACQ AND INTGRTN	
AMOUNT	CUMULATIVE AMOUNT

[redacted]

SOW 7.3

SPECIALIZED TT&C EQUIPMENT	
AMOUNT	CUMULATIVE AMOUNT

[redacted]

EXHIBIT F
PERFORMANCE ALGORITHM

WILL BE COMPLETED AS A RESULT OF
THE DESIGN STUDY PHASE