LANDSAT

Draft

21 NOVEMBER

STAT

Request for Proposals for Transfer of United States Civil Operational Remote Sensing Satellites to the Private Sector

LANDSAT ONLY

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SEB

FOR ~~PUBLIC~~ REVIEW

AND COMMENT

~~21 OCTOBER, 1983~~

18 NOV 1983

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

OBJECTIVES OF THE SOLICITATION

The Government has developed, launched and operated a set of satellites to supply earth remote sensing data useful for resource assessment. The purpose of this solicitation is to determine the terms and conditions under which a private sector entity would develop and operate similar systems on a commercial basis.

If evaluation of resultant proposals shows that transfer of the Landsat system to the private sector is feasible and desirable, contracting for the system will not occur until:

(1) The Secretary of Commerce has presented Congress a comprehensive statement of recommended policies, procedures, conditions, and limitations to which any contract should be subject; and

(2) Congress thereafter enacts a law which contains such policies, procedures, conditions, and limitations as it deems appropriate.

The basic objectives are:

(1) to develop a commercial system based on the present Landsat operational satellite system capabilities;

(2) to maintain U.S. leadership in remote sensing data from space; and

(3) to foster the economic benefits of such data for the private and public good.

The Government baseline concept for this solicitation is that the owner(s)/operator(s) would develop a system to provide data and services as described in the solicitation, under contractual agreement with the Government. In fulfilling this obligation, the owner(s)/operator(s) would operate the present government Landsat satellite system throughout its lifetime. After which, the owner(s)/operator(s) will provide its own system and continue to deliver data for both commercial and Government use.

The Government, however, is interested in innovative techniques or systems which would either improve service or reduce cost in the current system. Thus, offerers are encouraged to respond, not only to the basic requirements, but to propose alternatives which would incorporate new technology or innovative approaches and which would be advantageous to the Government, to the Offerer or to both.

As a matter of Federal policy, the solicitation is designed to protect both national security and international considerations. A classified appendix to the solicitation contains information on how the contractor must address national security concerns.

Because the U.S. Government is no longer likely to be the sole or even the most important customer for land remote sensing data, international considerations on how a future operator will do business may not be as constrained as at present. However, should the operator wish to depart from

olicies now used by the Federal Government vis-a-vis Landsat data, he must seek approval from the Federal Government. In keeping with the above concerns, an offeror must be a U. S. Firm as specified in the solicitation.

In general the Source Evaluation Board has identified no need for new regulatory authority to implement proposals acceptable under this RFP. Antitrust regulations, international trade controls, national defense reviews, communications frequency allocations and launch approvals can all be handled within present Government regulatory apparatus. Most other provisions can be handled through normal contractual arrangements between the Government and a contractor. The possible exception is that the Government may need additional authority to impose civil penalties should a successful offeror fail to meet the national security or some of the international requirements outlined in the RFP.

There is a fundamental difference between the present situation and that envisioned for the future. Today the government owns the satellite data. In the future, the owner(s)/operator(s) would own the raw data produced by the commercial satellite system. The Government would then buy data from the owner(s)/operator(s), following which, the Government would further process and distribute the data in certain delimited ways.

An Offerer must propose to provide the Satellite, Ground Control and Data Preprocessing as needed to develop and operate a commercial remote sensing system. Also required is a market development proposal which will demonstrate that commercialization is feasible.

Nothing in this solication is intended to limit an Offeror from pursuing other related business opportunities which are not within the scope of this solicitation (e.g. providing specialized services to customers other than the Government). Neither does the Government intend to limit itself to buying data and/or services from only the successful bidder under this solicitation.

The Government would require and support contractual assurances for the development of a system to provide the routine availability and timeliness of certain land remote sensing data. While the Government expects that it must make some initial investment to assure the success of a commercial operation, cost to the Government over the life of the contract(s) will be an important factor in proposal evaluation and contractor selection. As a baseline for cost assessment, the Government has prepared an accounting of its assets and operating costs. This accounting is summarized in the solicitation.

SOLICITATION, OFFER AND AWARD

3 CERTIFIED FOR NATIONAL DEFENSE UNDER DPS REG 1 APP OR DMS REG. 1 RATING

4 PAGE 1 OF

1 CONTRACT (Proc. Inst. Ident.) NO.

2 SOLICITATION NO

☐ ADVERTISED (IFB) ☒ NEGOTIATED (RFP)

5 DATE ISSUED

6 REQUISITION/PURCHASE REQUEST NO

7 ISSUED BY CODE

U.S. Department of Commerce
Source Evaluation Board for Civil Space Remote Sensing

8 ADDRESS OFFER TO (If other than block 7)

Source Evaluation Board for Civil Space Remote Sensing
NBOC-1, Third Floor, 11420 Rockville Pike
Rockville, Md 20852

In advertised procurement "offer" and "offeror" shall be construed to mean "bid" and "bidder"

SOLICITATION

9. Sealed offers in original and _____ copies for furnishing the supplies or services in the Schedule will be received at the place specified in block 8, *or if handcarried, in the depository located in* _____ until _____ *local time* _____ *(Hour)* *(Date)*

If this is an advertised solicitation, offers will be publicly opened at that time.

All offers are subject to the following:

1. The Solicitation Instructions and Conditions, SF 33-A, _____ edition which is attached or incorporated herein by reference.
3. The Schedule included herein and/or attached hereto.
4. Such other provisions, representations, certifications, and specifications as are attached or incorporated herein by reference. *(Attachments are listed in schedule.)*

FOR INFORMATION CALL (Name & telephone no.) (No collect calls) ▶

SCHEDULE

10 ITEM NO	11 SUPPLIES/SERVICES	12 QUANTITY	13 UNIT	14 UNIT PRICE	15 AMOUNT
	Transfer of Land Remote Sensing (Landsat) ~~and meteorological (Metsat)~~ satellites and performance of associated services.				

See continuation of schedule on page 4

OFFER *(pages 2 and 3 must also be fully completed by offeror)*

16. DISCOUNT FOR PROMPT PAYMENT (See par. 9, SF 33-A)

___ % 10 CALENDAR DAYS ___ % 20 CALENDAR DAYS ___ % 30 CALENDAR DAYS ___ % ___ CALENDAR DAYS

17. OFFEROR CODE FACILITY CODE

NAME AND ADDRESS (Street, city, county, State and ZIP code)

AREA CODE AND TELEPHONE NO ▶

☐ Check if remittance address is different from above — enter such address in Schedule

18. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)

19. SIGNATURE

20. OFFER DATE

AWARD *(To be completed by Government)*

21. ACCEPTED AS TO ITEMS NUMBERED

22. AMOUNT

23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES (4 copies unless otherwise specified) TO ADDRESS SHOWN IN BLOCK _____

25. NEGOTIATED PURSUANT TO ☐ 10 U.S.C. 2304(a) ( ) ☐ 41 U.S.C. 252(c) ( )

26. ADMINISTERED BY (If other than block 7) CODE

27. PAYMENT WILL BE MADE BY CODE

28. NAME OF CONTRACTING OFFICER (Type or print)

29. UNITED STATES OF AMERICA

BY

(Signature of contracting officer)

30. AWARD DATE

Award will be made on this form, or on Standard Form 26, or by other official written notice

33-131

Standard Form 33 Page 1 (REV. 3-77)
Prescribed by GSA, FPR (41 CFR) 1-16.101

SECTION I SF-33 SOLICITATION, OFFER AND AWARD

This Section has general information on Government procedures concerning proposal submission, together with some representations and certifications that must be provided by responsive Offerors

REPRESENTATIONS, CERTIFICATIONS AND ACKNOWLEDGMENTS

REPRESENTATIONS *(Check or complete all applicable boxes or blocks.)*
The offeror represents as part of his offer that:

1. **SMALL BUSINESS** *(See par. 14 on SF 33-A.)*
He ☐ is, ☐ is not, a small business concern. If offeror is a small business concern and is not the manufacturer of the supplies offered, he also represents that all supplies to be furnished hereunder ☐ will, ☐ will not, be manufacturered or produced by a small business concern in the United States, its possessions, or Puerto Rico.

2. **MINORITY BUSINESS ENTERPRISE**
He ☐ is, ☐ is not, a minority business enterprise. A minority business enterprise is defined as a "business, at least 50 percent of which is owned by minority group members or, in case of publicly owned businesses, at least 51 percent of the stock of which is owned by minority group members." For the purpose of this definition, minority group members are Negroes, Spanish-speaking American persons, American-Orientals, American-Indians, American Eskimos, and American-Aleuts.

3. **REGULAR DEALER – MANUFACTURER** *(Applicable only to supply contracts exceeding $10,000.)*
He is a ☐ regular dealer in ☐ manufacturer of, the supplies offered.

4. **CONTINGENT FEE** *(See par. 15 on SF 33-A.)*
(a) He ☐ has, ☐ has not, employed or retained any company or persons *(other than a full-time bona fide employee working solely for the offeror)* to solicit or secure this contract, and (b) he ☐ has, ☐ has not, paid or agreed to pay any company or person *(other than a full-time bona fide employee working solely for the offeror)* any fee, commission, percentage, or brokerage fee contingent upon or resulting from the award of this contract; and agrees to furnish information relating to (a) and (b) above, as requested by the Contracting Officer. *(Interpretation of the representation, including the term "bona fide employee," see Code of Federal Regulations, Title 41, Subpart 1-1.5.)*

5. **TYPE OF BUSINESS ORGANIZATION**
He operates as ☐ an individual, ☐ a partnership, ☐ a nonprofit organization, ☐ a corporation, incorporated under the laws of the State of _____.

6. **AFFILIATION AND IDENTIFYING DATA** *(Applicable only to advertised solicitations.)*
Each offeror shall complete (a) and (b) if applicable, and (c) below:

(a) He ☐ is, ☐ is not, owned or controlled by a parent company. *(See par. 16 on SF 33-A.)*
(b) If the offeror is owned or controlled by a parent company, he shall enter in the blocks below the name and main office address of the parent company:

NAME OF PARENT COMPANY AND MAIN OFFICE ADDRESS (Include ZIP code) ▶		
(c) EMPLOYER'S IDENTIFICATION NUMBER (See par. 17 on SF 33-A)	OFFEROR'S E I NO	PARENT COMPANY'S E I NO

7. **EQUAL OPPORTUNITY**
(a) He ☐ has, ☐ has not, participated in a previous contract or subcontract subject either to the Equal Opportunity clause herein or the clause originally contained in section 301 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114; that he ☐ has, ☐ has not, filed all required compliance reports; and that representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained prior to subcontract awards. (The above representation need not be submitted in connection with contracts or subcontracts which are exempt from the equal opportunity clause.)
(b) The bidder (or offeror) represents that (1) he ☐ has developed and has on file, ☐ has not developed and does not have on file, at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2) or (2) he ☐ has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor. *(The above representation shall be completed by each bidder (or offeror) whose bid (offer) is $50,000 or more and who has 50 or more employees.)*

CERTIFICATIONS *(Check or complete all applicable boxes or blocks)*

1. **BUY AMERICAN CERTIFICATE**
The offeror certifies as part of his offer, that: each end product, except the end products listed below, is a domestic end product (as defined in the *clause* entitled "Buy American Act"); and that components of unknown origin have been considered to have been mined, produced, or manufactured outside the United States.

EXCLUDED END PRODUCTS	COUNTRY OF ORIGIN

2. **CLEAN AIR AND WATER** *(Applicable if the bid or offer exceeds $100,000 or the contracting officer has determined that orders under an indefinite quantity contract in any year will exceed $100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c8(c)(1)) or the Federal Water Pollution Control Act (33 U.S.C. 1319(c)) and is listed by EPA, or is not otherwise exempt.)*

The bidder or offeror certifies as follows:

(a) Any facility to be utilized in the performance of this proposed contract ☐ has, ☐ has not, been listed on the Environmental Protection Agency List of Violating Facilities.

(b) He will promptly notify the contracting officer, prior to award of the receipt of any communication from the Director, Office of Federal Activities, Environmental Protection Agency, indicating that any facility which he proposes to use for the performance of the contract is under consideration to be listed on the EPA list of Violating Facilities.

(c) He will include substantially this certification, including this paragraph (c), in every nonexempt subcontract.

3. **CERTIFICATION OF INDEPENDENT PRICE DETERMINATION** *(See par. 18 on SF 33-A)*

(a) By submission of this offer, the offeror certifies, and in the case of a joint offer, each party thereto certifies as to its own organization, that in connection with this procurement:

(1) The prices in this offer have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other offeror or with any competitor;

(2) Unless otherwise required by law, the prices which have been quoted in this offer have not been knowingly disclosed by the offeror and will not knowingly be disclosed by the offeror prior to opening in the case of an advertised procurement or prior to award in the case of a negotiated procurement, directly or indirectly to any other offeror or to any competitor; and

(3) No attempt has been made or will be made by the offeror to induce any other person or firm to submit or not to submit an offer for that purpose of restricting competition.

(b) Each person signing this offer certifies that:

(1) He is the person in the offeror's organization responsible within that organization for the decision as to the prices being offered herein and that he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3), above; or

(2) (i) He is not the person in the offeror's organization responsible within that organization for the decision as to the prices being offered herein but that he has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated and will not participate, in any action contrary to (a)(1) through (a)(3) above, and as their agent does hereby so certify; and (ii) he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above.

4. **CERTIFICATION OF NONSEGREGATED FACILITIES** *(Applicable to (1) contracts, (2) subcontracts, and (3) agreements with applicants who are themselves performing federally assisted construction contracts, exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause.)*

By the submission of this oid, the bidder, offeror, applicant, or subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The bidder, offeror, applicant, or subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion or national origin, because of habit, local custom, or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause; that he will retain such certifications in his files; and that he will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

Notice to prospective subcontractors of requirement for certifications of nonsegregated facilities.

A Certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually). *NOTE: The penalty for making false offers is prescribed in 18 U.S.C. 1001.*

ACKNOWLEDGMENT OF AMENDMENTS The offeror acknowledges receipt of amendments to the Solicitation for offers and related documents numbered and dated as follows:	AMENDMENT NO	DATE	AMENDMENT NO	DATE

NOTE: Offers must set forth full, accurate and complete information as required by this Solicitation (including attachments). The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

SCHEDULE. *Continuation*

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT

If this Schedule is Continued on SF-36, check here ▶ ☐

• U. S. GOVERNMENT PRINTING OFFICE : 1978 O - 261-647 (2363)

Declassified in Part - Sanitized Copy Approved for Release 2011/11/07 : CIA-RDP05T02051R000200380019-8

REPRESENTATIONS, CERTIFICATIONS AND ACKNOWLEDGEMENTS-Continued from SF-33

WOMAN OWNED BUSINESS

Concern is ( ) is not ( ) a woman-owned business.

A woman-owned business is a business which is, at least, 51 percent owned, controlled, and operated by a woman or women. Controlled is defined as exercising the power to make policy decisions. Operated is defined as actively involved in the day-to-day management.

For the purposes of this definition, businesses which are publicly owned, joint stock associations, and business trusts are exempted. Exempted businesses may voluntarily represent that they are, or are not, woman-owned if this information is available.

DUN AND BRADSTREET NUMBER

Offerors are requested to provide their Dun and Bradstreet number in Block 17 (Facility Code) of Standard Form 33.

COST ACCOUNTING STANDARDS CERTIFICATION - NONDEFENSE APPLICABILITY

Any negotiated contract in excess of $100,000 resulting from this solicitation shall be subject to the requirements of the clauses entitled Cost Accounting Standards - Nondefense Contract (FPR 1-3.1204-2(a)) and Administration of Cost Accounting Standards (FPR 1-3.1204-1(b)) if it is awarded to a contractor's business unit that is performing a national defense contract or subcontract which is subject to cost accounting standards pursuant to 4 CFR 331 at the time of award, except contracts which are otherwise exempt (see FPR 1-3.1203-2(a) and (c)(4)). Otherwise, an award resulting from this solicitation shall be subject to the requirements of the clauses entitled Consistency of Cost Accounting Practices - Nondefense contract (FPR 1-3.1204-2(b)) and Administration of Cost Accounting Standards (FRP 1-3.1204-1(b)) if the award is (i) the first negotiated contract over $500,000 in the event the award is to a contractor's business unit that is not performing under any CAS covered national defense or nondefense contract or subcontract, or (ii) a negotiated contract over $100,000 in the event the award is to a contractor's business unit that is performing under any CAS covered national defense or nondefense contract or subcontract, except contracts which are otherwise exempt (see FPR 1-3.1203-2(a) and (c)(4)). This soliciation notice is not applicable to small business concerns.

☐ Yes ☐ No

Certificate of CAS Applicability

The offeror hereby certifies that:

A. It is currently performing a negotiated national defense contract or subcontract that contains a Cost Accounting Standards Clause (4 CFR 331), and it is currently required to accept that clause in any new negotiated national defense contracts it receives that are subject to cost accounting standards.

B. It is currently performing a negotiated national defense or nondefense contract or subcontract that contains a cost accounting standards clause required by 4 CFR 331 or 332 or by FPR Subpart 103.12, but it is not required to accept the 4 CFR 331 clause in new negotiated national defense contracts or subcontract which it receives that are subject to cost accounting standards.

C. It is not performing any CAS covered national defense or nondefense contract or subcontract. The Offeror further certifies that it will immediately notify the contracting officer in writing in the event that it is awarded any negotiated national defense or nondefense contract or subcontract containing any cost accounting standards clause subsequent to the date of this certificate but prior to the date of the award of a contract resulting from this solicitation.

D. It is an educational institution receiving contract awards subject to FPR Subpart 1-15.3 (FMC 73-8, OMB Circular A-21).

E. It is a state or local government receiving contract awards subject to FPR Subpart 1-15.7 (FMC 74-4, OMB Circular A-87).

F. It is a hospital.

NOTE: Certain firm fixed price negotiated nondefense contracts awarded on the basis of price competition may be determined by the Contracting Officer (at the time of award) to be exempt from cost accounting standards (FPR 1-3.1203-2(c)(4)(iv)).

G. The offeror, subject to cost accounting standards but not certifying under D., E., or F above, further certifies that practices used in estimating costs in pricing this proposal are consistent with the practices disclosed in the Disclosure Statement(s) where they have been submitted pursuant to CASB regulations (4 CFR 351).

Data Required - CAS Covered Offerors

The offeror certifying under A. or B. above, but not under D., E., or F. above, is required to furnish the name, address (including agency or department component), and telephone number of the cognizant contracting officer administering the offeror's CAS covered contracts. If A above is checked, the offeror will also identify those currently effective cost accounting standards, if any, which upon award of the next negotiated national defense contract or subcontract will become effective upon the offeror.

Name of Co._____

Address _____

_____

Telephone number_____

Standards not yet applicable:_____

CERTIFICATION REGARDING SUBCONTRACTING AND PLANS

Subcontracting Representation

(A) The offeror ( ) contractor ( ) represents that the following conditions prevail which determine whether the firm shall be required to submit a subcontracting plan for small business concerns and small business concerns owned and controlled by socially economically disadvantaged individuals:

(i) it is ( ) a small business as defined in accordance with Section 3 of the Small Business Act (15 USC 632);

(ii) subcontracting possibilities are not ( ) offered with respect to this contract;

(iii) the contract, including all subcontracts thereunder, will be performed entirely outside of the United States, its territories and possessions, the District of Columbia and the Commonwealth of Puerto Rico and is therefore not covered ( );

(iv) the contract, including all prior modifications and/or extensions of which this award is a part and all projected future actions, shall not ( ) exceed $1,000,000 (if solely for construction of a public facility) or $500,000 otherwise; and

(v) the contract is for services which are personal in nature and is therefore not covered ( ).

(B) The offeror ( ) contractor ( ) represents that it is ( ) is not ( ) required to submit plans for subcontracting with small disadvantaged businesses because it has properly executed one or more of the above representations.

(C) The offeror ( ) contractor ( ) certifies that it will submit ( ) a Subcontracting Plan in accordance with the terms and conditions specified unless exempted by (A) above, and that it will require the same of all appropriate subcontractors unless they certify that they are exempt.

Failure to execute this representation will be deemed a minor informality and the offeror will be permitted to correct the ommission prior to award.

SMALL AND SMALL DISADVANTAGED BUSINESS CERTIFICATION

(A) The offeror ( ) contractor ( ) certifies that it is ( ) is not ( ) a small business concern as defined in accordance with Section 3 of the Small Business Act (15 USC 632);

(B) The offeror ( ) contractor ( ) certifies that it is a small business (as set forth in (A) above) and is ( ) is not ( ) owned and controlled by socially and economically disadvantaged individuals. Such a firm is defined as one -

(i) which is at least 51 per centum owned by one or more such individuals or, in the case of publicly owned business, at least 51 per centum of the stock is owned by such individuals.

(ii) whose management and daily business operations are controlled by one or more such individuals, and

(iii) which certifies concerning said ownership and control in accordance with section C below.

(C) The offeror ( ) contractor ( ) certifies that it is ( ) is not ( ) a minority individual(s) in accordance with (C)(i) below or that it is ( ) is not ( ) socially and economically disadvantaged in accordance with section (C)(ii) or (C)(iii). Socially and economically disadvantaged individuals are defined as:

(i) United States citizens who are Black Americans, Hispanic Americans, Native Americans, or other specified minorities;

(ii) any other individual found to be disadvantaged pursuant to section 8(a) of the Small Business Act (15 USC 637); or

(iii) any other individual defined as socially, and economically disadvantaged for purposes relating to other sections of the Small Business Act.

No solicitation may be properly considered without this certification and no award may be made without it being executed.

TECHNICAL DATA CERTIFICATION

The offeror shall submit with its offer a certification as to whether it has delivered or is obligated to deliver to the Government, under any contract or subcontract, the same or substantially the same technical data included in its offer. If so, the offeror shall identify one such contract or subcontract under which such technical data was delivered or will be delivered, and the place of such delivery.

SECTION II SF-33-A SOLICITATION INSTRUCTIONS AND CONDITIONS

Preprinted forms are included here outlining General Conditions, definitions, and instructions applicable to general Government bidding procedures as a whole.

SOLICITATION INSTRUCTIONS AND CONDITIONS

1. DEFINITIONS.

As used herein:

(a) The term "solicitation" means Invitation for Bids (IFB) where the procurement is advertised, and Request for Proposal (RFP) where the procurement is negotiated.

(b). The term "offer" means bid where the procurement is advertised, and proposal where the procurement is negotiated.

(c) For purposes of this solicitation and Block 2 of Standard Form 33, the term "advertised" includes Small Business Restricted Advertising and other types of restricted advertising.

2. PREPARATION OF OFFERS.

(a) Offerors are expected to examine the drawings, specifications, Schedule, and all instructions. Failure to do so will be at offeror's risk.

(b) Each offeror shall furnish the information required by the solicitation. The offeror shall sign the solicitation and print or type his name on the Schedule and each Continuation Sheet thereof on which he makes an entry. Erasures or other changes must be initialed by the person signing the offer. Offers signed by an agent are to be accompanied by evidence of his authority unless such evidence has been previously furnished to the issuing office.

(c) Unit price for each unit offered shall be shown and such price shall include packing unless otherwise specified. A total shall be entered in the Amount column of the Schedule for each item offered. In case of discrepancy between a unit price and extended price, the unit price will be presumed to be correct, subject, however, to correction to the same extent and in the same manner as any other mistake.

(d) Offers for supplies or services other than those specified will not be considered unless authorized by the solicitation.

(e) Offeror must state a definite time for delivery of supplies or for performance of services unless otherwise specified in the solicitation.

(f) Time, if stated as a number of days, will include Saturdays, Sundays and holidays.

(g) Code boxes are for Government use only.

3. EXPLANATION TO OFFERORS. Any explanation desired by an offeror regarding the meaning or interpretation of the solicitation, drawings, specifications, etc., must be requested in writing and with sufficient time allowed for a reply to reach offerors before the submission of their offers. Oral explanations or instructions given before the award of the contract will not be binding. Any information given to a prospective offeror concerning a solicitation will be furnished to all prospective offerors as an amendment of the solicitation, if such information is necessary to offerors in submitting offers on the solicitation or if the lack of such information would be prejudicial to uninformed offerors.

4. ACKNOWLEDGMENT OF AMENDMENTS TO SOLICITATIONS. Receipt of an amendment to a solicitation by an offeror must be acknowledged (a) by signing and returning the amendment, (b) on page three of Standard Form 33, or (c) by letter or telegram. Such acknowledgment must be received prior to the hour and date specified for receipt of offers.

5. SUBMISSION OF OFFERS.

(a) Offers and modifications thereof shall be enclosed in sealed envelopes and addressed to the office specified in the solicitation. The offeror shall show the hour and date specified in the solicitation for receipt, the solicitation number, and the name and address of the offeror on the face of the envelope.

(b) Telegraphic offers will not be considered unless authorized by the solicitation; however, offers may be modified or withdrawn by written or telegraphic notice, provided such notice is received prior to the hour and date specified for receipt. (However, see paragraphs 7 and 8.)

(c) Samples of items, when required, must be submitted within the time specified, and unless otherwise specified by the Government, at no expense to the Government. If not destroyed by testing, samples will be returned at offeror's request and expense, unless otherwise specified by the solicitation.

6. FAILURE TO SUBMIT OFFER. If no offer is to be submitted, do not return the solicitation unless otherwise specified. A letter or postcard shall be sent to the issuing office advising whether future solicitations for the type of supplies or services covered by this solicitation are desired. Failure of the recipient to offer, or to notify the issuing office that future solicitations are desired, may result in removal of the name of such recipient from the mailing list for the type of supplies or services covered by the solicitation.

(e) Notwithstanding (a), (b), and (c), of this provision, a late modification of an otherwise successful proposal which makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

(f) Proposals may be withdrawn by written or telegraphic notice received at any time prior to award. Proposals may be withdrawn in person by an offeror or his authorized representative, provided his identity is made known and he signs a receipt for the proposal prior to award.

Note: The term "telegram" includes mailgrams.

Note: The alternate late proposals, modifications of proposals and withdrawals of proposals provision prescribed by 41 CFR 1-3.802-2(b) shall be used in lieu of provision 8, if specified by the contract.

9. DISCOUNTS.

(a) Notwithstanding the fact that a blank is provided for a ten (10) day discount, prompt payment discounts offered for payment within less than twenty (20) calendar days will not be considered in evaluating offers for award, unless otherwise specified in the solicitation. However, offered discounts of less than 20 days will be taken if payment is made within the discount period, even though not considered in the evaluation of offers.

(b) In connection with any discount offered, time will be computed from date of delivery of the supplies to carrier when delivery and acceptance are at point of origin, or from date of delivery at destination or port of embarkation when delivery and acceptance are at either of those points, or from the date correct invoice or voucher is received in the office specified by the Government, if the latter date is later than date of delivery. Payment is deemed to be made for the purpose of earning the discount on the date of mailing of the Government check.

10. AWARD OF CONTRACT.

(a) The contract will be awarded to that responsible offeror whose offer conforming to the solicitation will be most advantageous to the Government, price and other factors considered.

(b) The Government reserves the right to reject any or all offers and to waive informalities and minor irregularities in offers received.

(c) The Government may accept any item or group of items of any offer, unless the offeror qualifies his offer by specific limitations. UNLESS OTHERWISE PROVIDED IN THE SCHEDULE, OFFERS MAY BE SUBMITTED FOR ANY QUANTITIES LESS THAN THOSE SPECIFIED; AND THE GOVERNMENT RESERVES THE RIGHT TO MAKE AN AWARD ON ANY ITEM FOR A QUANTITY LESS THAN THE QUANTITY OFFERED AT THE UNIT PRICES OFFERED UNLESS THE OFFEROR SPECIFIES OTHERWISE IN HIS OFFER.

(d) A written award (or Acceptance of Offer) mailed (or otherwise furnished) to the successful offeror within the time for acceptance specified in the offer shall be deemed to result in a binding contract without further action by either party.

The following paragraphs (e) through (h) apply only to negotiated solicitations:

(e) The Government may accept within the time specified therein, any offer (or part thereof, as provided in (c) above), whether or not there are negotiations subsequent to its receipt, unless the offer is withdrawn by written notice received by the Government prior to award. If subsequent negotiations are conducted, they shall not constitute a rejection or counter offer on the part of the Government.

(f) The right is reserved to accept other than the lowest offer and to reject any or all offers.

(g) The Government may award a contract, based on initial offers received, without discussion of such offers. Accordingly, each initial offer should be submitted on the most favorable terms from a price and technical standpoint which the offeror can submit to the Government.

(h) Any financial data submitted with any offer hereunder or any representation concerning facilities or financing will not form a part of any resulting contract; provided, however, that if the resulting contract contains a clause providing for price reduction for defective cost or pricing data, the contract price will be subject to reduction if cost or pricing data furnished hereunder is incomplete, inaccurate, or not current.

11. GOVERNMENT-FURNISHED PROPERTY. No material, labor, or facilities will be furnished by the Government unless otherwise provided for in the solicitation.

12. LABOR INFORMATION. General information regarding the requirements of the Walsh-Healey Public Contracts Act (41 U.S.C. 35–45), the Contract Work Hours Standards Act (40 U.S.C. 327–330), and the Service Contract Act of 1965 (41 U.S.C. 351–357) may be obtained from the Department of Labor, Washington, D.C. 20210, or from any regional office of that agency. Requests for information should include the solicitation number, the name and address of the issuing agency, and a description of the supplies or services.

13. SELLER'S INVOICES. Invoices shall be prepared and submitted in quadruplicate (one copy shall be marked "original") unless otherwise specified. Invoices shall contain the following information: Contract and order number (if any), item numbers, description of supplies or services, sizes, quantities, unit prices, and extended totals. Bill of lading number and weight of shipment will be shown for shipments made on Government bills of lading.

14. SMALL BUSINESS CONCERN. A small business concern for the purpose of Government procurement is a concern, including its affiliates, which is independently owned and operated, is not dominant in the field of operation in which it is submitting offers on Government contracts, and can further qualify under the criteria concerning number of employees, average annual receipts, or other criteria, as prescribed by the Small Business Administration. (See Code of Federal Regulations, Title 13, Part 121, as amended, which contains detailed industry definitions and related procedures.)

15. CONTINGENT FEE. If the offeror, by checking the appropriate box provided therefor, has represented that he has employed or retained a company or person (other than a full-time bona fide employee working solely for the offeror) to solicit or secure this contract, or that he has paid or agreed to pay any fee, commission, percentage, or brokerage fee to any company or person contingent upon or resulting from the award of this contract, he shall furnish, in duplicate, a complete Standard Form 119, Contractor's Statement of Contingent or Other Fees. If offeror has previously furnished a completed Standard Form 119 to the office issuing this solicitation, he may accompany his offer with a signed statement (a) indicating when such completed form was previously furnished, (b) identifying by number the previous solicitation or contract, if any, in connection with which such form was submitted, and (c) representing that the statement in such form is applicable to this offer.

16. PARENT COMPANY. A parent company for the purpose of this offer is a company which either owns or controls the activities and basic business policies of the offeror. To own another company means the parent company must own at least a majority (more than 50 percent) of the voting rights in that company. To control another company, such ownership is not required; if another company is able to formulate, determine, or veto basic business policy decisions of the offeror, such other company is considered the parent company of the offeror. This control may be exercised through the use of dominant minority voting rights, use of proxy voting, contractual arrangements, or otherwise.

17. EMPLOYER'S IDENTIFICATION NUMBER. (Applicable only to advertised solicitations.) The offeror shall insert in the applicable space on the offer form, if he has no parent company, his own Employer's Identification Number (E.I. No.) (Federal Social Security Number used on Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941), or, if he has a parent company, the Employer's Identification Number of his parent company.

18. CERTIFICATION OF INDEPENDENT PRICE DETERMINATION.

(a) This certification on the offer form is not applicable to a foreign offeror submitting an offer for a contract which requires performance or delivery outside the United States, its possessions, and Puerto Rico.

(b) An offer will not be considered for award where (a)(1), (a)(3), or (b) of the certification has been deleted or modified. Where (a)(2) of the certification has been deleted or modified, the offer will not be considered for award unless the offeror furnishes with the offer a signed statement which sets forth in detail the circumstances of the disclosure and the head of the agency, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

19. ORDER OF PRECEDENCE. In the event of an inconsistency between provisions of this solicitation, the inconsistency shall be resolved by giving precedence in the following order: (a) the Schedule; (b) Solicitation Instructions and Conditions; (c) General Provisions; (d) other provisions of the contract, whether incorporated by reference or otherwise; and (e) the specifications.

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GENERAL CONDITIONS

(a) Unnecessarily elaborate brochures or other presentations beyond that sufficient to present a complete and effective proposal are not desired and may be construed as an indication of the offeror's lack of cost consciousness. Elaborate art work, expensive paper and bindings and expensive visual and other presentation aids are neither necessary nor wanted.

(b) This request does not commit the Government to award a contract or to pay any costs incurred in the preparation of a response.

(c) At the discretion of the Contracting Officer, a pre-award survey of your firm, including interviews with your personnel, may be performed. The Government may conduct pre-award reviews covering employment practices of the contractor or subcontractors as they relate to Equal Opportunity.

DISCUSSION AND/OR NEGOTIATION WITH OFFEROR(S)

(a) After receipt of proposals and during the evaluation process, it may be necessary to call in one or more of the offerors who are under consideration for an award for further discussions.

(b) Oral presentations may be required by the Goverenment from any or all of the offerors. Offerors will be notified of the time and place for such presentations.

PROPOSAL ACCEPTANCE PERIOD

Proposals offering less than one hundred eighty (180) days for acceptance by the Government from the date set for opening/closing will not be considered.

RESTRICTION ON DISCLOSURE OF DATA

An offeror may include information in its offer, or otherwise provide information in conjunction with this solicitation, which the offeror considers proprietary or confidential, for use by the Government in evaluation of the offer or the responsibility of the offeror. Each sheet of data to be provided by the offeror which includes information so restricted must be appropriately marked by the offeror. Data so marked may nevertheless be subject to release in whole or in part as 'information' as contained in 'records' pursuant to the requirements of the Freedom of Information Act, 5 U.S.C. 552, as amended (hereinafter "the Act"), if and to the extent it is determined by the Government that such information is not exempt from disclosure under the Act. However, data appropriately marked as restricted will not be subject to release under the Act without notification of the offeror. In the absence of a request pursuant to the Act for release of data which is appropriately marked, the restriction shall be honored in accordance with its terms.

OFFERORS REPRESENTATIVES

The proposal shall clearly identify the individual(s) responsible and authorized to clarify, negotiate specifics of the offer and to contractually bind the offeror to any agreement(s) reached. Include name, title, extent of authority and telphone number(s).

DISPOSAL OF PROPOSALS

One copy of the proposal submitted by an unsuccessful offeror will be retained in the Contracting Officer's files. All other copies shall be disposed of by the Contracting Officer as he may determine.

ACCURATE AND COMPLETE INFORMATION

The proposal must contain accurate and complete information and the proposal must be comprehensive and complete and prepared in accordance with the format specified in the Instructions for Proposals Preparation. The note at the bottom of page I-4 (back of SF-33) of this Solicitation states that offers must set forth full, accurate, and complete information as required by this Solicitation (including attachments) and that the penalty for making false statements in offers is prescribed in 18 U.S.C. 1001. The penalty prescribed in 18 U.S.C. 1001 provides:

> "Whoever, in any manner within the jurisdiction of any department or agency of the United States, knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes a false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry shall be fined not more than $10,000 or imprisoned not more than five years, or both."

The Government may utilize any available information in the evaluation of the proposals. However, the Government is not required to consider any information except that within the proposal. The offeror is responsible for providing all information necessary for the evaluation.

RETURN OF OFFERS

(a) MARKING: It is important that the outer envelope or wrapping of your offer be addressed as follows: (NOTE: Failure to so mark the outer cover could be the cause of your offer being misdirected and received too late at the required destination as shown below.)

_____.

Offeror's Return Address

_____

_____

_____

TO: U.S. Department of Commerce
Source Evaluation Board, Room 300
11420 Rockville Pike
Rockville, Maryland 20852

Solicitation No. _____

Closing Date _____

(b) HAND CARRIED OFFERS: Hand carried offers must be delivered to the office cited above. (SEALED OFFERS ONLY) Hand carried offers must be delivered and contact must be made with the above office by the time and date specified elsewhere in this solicitation. Proposals received at destination after the time and date specified for receipt will be considered LATE and dealt with in accordance with the Late Proposals Provisions.

ALTERNATE PROPOSALS

Offerors may submit more than one proposal in response to this RFP, provided each proposal meets all requirements specified herein. If alternate proposals are submitted, each proposal must be clearly labeled and identified on the cover page of each separate document.

Each proposal submitted by an offeror, including each alternate proposal that may be separately accepted, must be within the proposal page limitations stated in Section IV, Instructions for Proposal Preparation; i.e., if an offeror submits a proposal and one alternate proposal, each proposal must be within the page limiations stated in Section IV, although the two together may exceed the limitation.

NOTICE TO OFFERORS REGARDING SUBCONTRACTING

This Request for Proposals offers substantial subcontracting possiblities. And, as such, a subcontracting plan as required by Public Law 95-507 will be required of the offeror(s) selected for contract award. Offerors are cautioned to propose subcontracting arrangement as part of their technical and

business management proposals which are in keeping with the requirements of this law, and which will support acceptable subcontracting plans.

SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN (NEGOTIATED)

Subcontracting Plan for small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals.

(a) This requirement is applicable to procurements expected to result in the award of contracts exceeding $1,000,000, for construction, or $500,000 for all other contracts which offer subcontracting possibilities and are required to include the clause entitled "Utilization of Small Business Concerns and Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals."

Offerors who are notified that they are the apparent successful offeror shall, within 30 working days of such notice, furnish a subcontracting plan providing for the maximum practicable utilization of small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals. Such plan shall be included in and made part of any resulting contract. Submission of this plan will not be required of concerns which are themselves small businesses.

Should the offeror fail to submit such a plan within this time period or should subsequent negotiation fail to result in a plan that is acceptable, the offeror shall become ineligible for award. The determinaton of acceptability shall be based on whether the subcontracting plan provides the maximum practicable opportunity for both small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals to participate in the performance of the contract. Each aspect of the plan will be judged independently of the other.

The offeror's prior compliance with other such subcontracting plans shall also be considered by DOC in determining the responsibility of offeror for award of the contract.

(b) The offeror acknowledges that it is aware of the subcontracting plan requirements in this provision, and, if it is the apparent successful offeror, agrees to negotiate a plan which includes:

(1) percentage goals (expressed in terms of percentage of total planned subcontracting dollars) for the utilization as subcontractors of (i) small business concerns and (ii) small business concerns owned and controlled by socially and economically disadvantaged individuals;

(2) the name of an individual within the employ of the offeror who will administer the subcontracting program of the offeror and a description of the duties of such individual;

(3) a description of the efforts the offeror will take to assure that small business concerns and small business concerns owned and controlled by the socially and economically disadvantaged

individuals will have an equitable opportunity to compete for subcontracts;

(4) assurances that the offeror will include the "Utilization of Small and disadvantaged Small Business Concerns" clause in all subcontracts which offer further subcontracting opportunities, and that the offeror will require all subcontracts in excess of $1,000,000 in the case of a contract for the construction of any public facility, or in excess of $500,000 in the case of all other contracts, to adopt a plan similar to the plan required hereunder;

(5) assurances that the offeror will submit such periodic reports and cooperate in any studies or surveys as may be required by the Department of Commerce or the Small Business Administration in order to determine the extent of compliance by the offeror with the subcontracting plan; and

(6) a recitation of the types of records the successful offeror will maintain to demonstrate procedures which have been adopted to comply with the requirements and goals set forth in this plan, including the establishment of source lists of small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals; and efforts to identify and award subcontracts to such small business concerns.

(c) The offeror understands that:

(1) no contract will be awarded unless and until an acceptable plan is negotiated with the Contracting Officer and that an acceptable plan will be incorporated into the contract, as a material part thereof.

(2) where a subcontracting plan is deemed unacceptable, the Contracting Officer shall notify the contractor in writing of the reasons for determining the plan to be unacceptable. Such notice shall be given early enough in the negotiation process to allow the contractor to modify the plan within the prescribed time limits.

(3) the failure of any contractor or subcontractor to comply in good faith with (i) the clause entitled "Utilization of Small Business Concerns and Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals" or (ii) an approved plan required by this Small Business and Small Disadvantaged Business Subconracting Plan (Negotiated) provision will be a material breach of such contract or subcontract.

(4) nothing contained in this provision supersedes the requirements of Defense Manpower Policy Number 4A or any successor policy.

AVAILABILITY OF FUNDS

Funds are not presently available for this Request for Proposals (RFP).

PRE-PROPOSAL CONFERENCE

A preproposal conference in connection with the Request for Proposal will be held at _____, in _____. The conference is planned to last until _____, but may end earlier, depending upon the nature and volume of questions.

Technical and business personnel will be on hand to discuss requirements and answer questions. In order to expedite the discussion you are requested to submit your written questions to this office no later than _____, specifying the portion of the RFP in which clarification is desired.

Offerors who plan to have representation at this conference are requested to furnish the names and titles of their representatives no later than _____. Due to limited space, each company is invited to register six (6) members for the conference. If desired, companies may offer additional names of members to attend. If space is adequate to accommodate additional members, we will notify those making such requests by _____. We cannot guarantee that we will be able to accommodate individuals who attend without pre-registering. Questions and names of representatives should be submitted to _____ at the address shown on the cover page of this RFP.

Additional written questions will be entertained at the conference. Oral questions from the floor will not be allowed.

CONTRACT AWARD INFORMATION

Award of a contract under this RFP requires authorizing legislation. Offerors should keep this fact in mind when submitting proposals.

No legal liability on the part of the Government for payment of any money shall arise until a contract is awarded.

SECTION III INFORMATION TO OFFERORS

Included here are more specific information facts and instructions for this specific Request for Proposals.

Declassified in Part - Sanitized Copy Approved for Release 2011/11/07 : CIA-RDP05T02051R000200380019-8

1. GOVERNMENT OVERSIGHT

A. Concept

The following describes the general procedures by which the U.S. Government will oversee the operations of any system transferred to the private sector as a result of this RFP. It is designed to ensure that the Secretary of Commerce is aware of all important issues and has access to timely advice from concerned agencies, while at the same time not interfering with the substantive authorities vested by law in those agencies. It is the responsibility of each offeror to be familiar with the legal constraints and requirements applicable to its operation of the particular system(s) covered by its proposal, and to indicate its understanding by appropriate discussion in relevant portions of its proposal.

B. Framework

(1) The Department of Commerce will provide the contact point through which most inquiries and mandatory submissions from private operators of the LANDSAT system are received and acted on by the U.S. Government. Except as set forth below, matters will be handled directly by the Department of Commerce, through the Contracting Officer.

(2) On matters where an independent regulatory agency such as the Federal Communications Commission, has authority, all contacts should be made directly with that agency. The owner/operator must promptly notify the Contracting Officer when contact has been made with the independent regulatory agency and the outcome of that contact. The Department may, at its initiative, provide its views to that agency.

(3) In instances when the inquiries and submissions involve issues vested by statute or Executive Order in regulatory agencies within the Executive Branch, as with Federal Aviation Administration licensing (private launches), Department of State administration of the Arms Export Control Act and its implementing regulations, or Department of Commerce administration of the Export Administration Act and its implementing regulations, the operator must submit these inquiries and submissions to the Department of Commerce, through the Contracting Officer, for transmittal to the appropriate agency or department. The agency or department will then contact the operator directly and will inform the Department of Commerce of the outcome.

(4) Questions concerning the obligations imposed, or compliance with the obligations, in the International Commitments and National Security sections of this RFP will also be handled through the Contracting Officer. As in the case of Executive Branch regulatory agencies or departments, the decisions will be made by the appropriate agency or department. However, unlike the situation explained in paragraph 3 above, the

agency or department will provide the Department of Commerce with the guidance or decision that is to be passed on to the operator of these systems.

(5) It is anticipated that an Interagency Board will be established to provide the Department of Commerce with policy guidance as well as to perform an oversight function over the entire process to ensure that the interests of the U.S. Government are being met.

C. ENFORCEMENT

(1) It is expected that the legislation authorizing the transfer will provide for a broad range of legal procedures to protect the interests of the U.S., including authorizing the Secretary of Commerce to impose civil penalties for noncompliance with the national security and international commitment requirements set forth in this RFP. It is also expected that the legislation will authorize the promulgation of necessary regulations. Although the legislation may authorize regulation of all private sector remote sensing satellites under the jurisdiction of the U.S., for the purposes of this RFP, offerors should assume that, if any regulations are promulgated, they will apply only to the operators of the system covered by this RFP.

(2) Although there do not appear to be any antitrust problems inherent in the transfer of this system to the private sector, such problems may or may not arise depending on the substantive content of the proposal(s) received.

2. GOVERNMENT EMPLOYEES DISPLACED BY CONTRACT

This is not a requirement under OMB Circular A-76 where there is a cost comparison between the cost of Government operation and contract operation. However, the Government will require that Government employees be given the right of first refusal for employment openings. Consistent with Government conflict of interest standards, the Contractor shall give Government employees, displaced as a result of the conversion to contract performance, the right of first refusal for employment openings on the contract in positions for which they are qualified.

3. LATE PROPOSAL CLAUSE

(a) Any proposal received at the office designated in the solicitation after the exact time specified for receipt will not be considered unless it is received before award is made, and:

(1) It was sent by registered or certified mail not later than the fifth calendar day prior to the date specified for receipt of offers (e.g., an offer submitted in response to a solicitation requiring receipt of offers by the 20th day of the month must have been mailed by the 15th or earlier);
(2) It was sent by mail (or telegram if authorized) and it is

determined by the Government that the late receipt was due solely to mishandling by the Government after receipt at the Government installation;

(3) It is the only proposal received; or

(4) It offers significant cost or technical advantages to the Government, and it is received before a determination of the competitive range has been made.

(b) Any modification of a proposal is subject to the same conditions as in (a) of this provision.

(c) The only acceptable evidence to establish:

(1) The date of mailing of a late proposal or modification sent either by registered or certified mail is the U.S. Postal Service postmark on both the envelope or wrapper and on the original receipt from the U.S. Postal Service. If neither postmark shows a legible date, the proposal or modification of proposal shall be deemed to have been mailed late. (The term "postmark" means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed on the date of mailing by employees of the U.S. Postal Service. Therefore, offerors should request the postal clerk to place a hand cancellation bull's-eye "postmark" on both the receipt and the envelope or wrapper.)

(2) The time of receipt at the Government installation is the time-date stamp of such installation on the proposal wrapper or other documentary evidence of receipt maintained by the installation.

(d) Notwithstanding (a) and (b) of this provision, a late modification of an otherwise successful proposal which makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

(e) Proposals may be withdrawn by written or telegraphic notice received at any time prior to award. Proposals may be withdrawn in person by an offeror or his authorized representative, provided his identity is made known and he signs a receipt for the proposal prior to award.

NOTE: The term "telegram" includes mailgrams.

4. POTENTIAL CONFLICT OF INTEREST

Offerors have an affirmative obligation to disclose to the Government any personal or business relationships with Government personnel, or financial interest, which could present the appearance of an existing or potential conflict of interest. Failure to do so, if such becomes known by other means, could result in a determination of non-responsibility before award, or termination of the contract.

5. UNITED STATES FIRM

(a) Proposals will only be acceptable from United States firms. A United States firm is defined as follows:

(1)

A. The principal place of business and corporate headquarters shall be in the United States;

B. A majority of the corporate officers shall be United States citizens;

C. Key management and supervisory personnel shall be United States citizens; and

D. Corporate tax returns shall have been filed in the United States for a minimum of one year; or

(2)

A joint venture, corporation, or unincorporated association, owned or consisting entirely of individuals, corporations or partnerships meeting the requirements set forth in paragraph (1) above.

(b) Each offeror shall include, with its proposal, a certification that it is a U.S. firm, as defined above.

(c) It is essential for the Government to obtain information about foreign ownership, control, or influence which is sufficient to enable it to determine whether award of a contract to a firm may have a significant adverse effect on the national security or public health and safety. Therefore, in its response to Section VIII of this RFP, each offeror must indicate, in relevant places, its relationships with foreign interests.

(d) A foreign interest is any of the following:

(1) Foreign government or foreign government agency or instrumentality thereof;

(2) Any form of business enterprise organized under the laws of any country other than the United States or its possessions;

(3) Any form of business enterprise organized or incorporated under the laws of the U.S., or a state or other jurisdiction within the U.S. which is owned, controlled, or influenced by a foreign government, agency, firm, corporation, or person; or

(4) Any natural person who is not a U.S. citizen.

(e) Foreign ownership, control, or influcence (FOCI) will be considered to exist when the degree of ownership, control, or influence over an offeror/bidder or a contractor by a foreign interest is such that a reasonable basis exists for concluding the compromise of classified information or unclassified sensitive information may possibly result.

6. FAIR AND EQUITABLE COMPENSATION TO PROFESSIONAL EMPLOYEES

NOTICE TO OFFERORS

NOTE THE SOLICITATION PROVISIONS RELATING TO FAIR AND EQUITABLE COMPENSATION TO PROFESSIONAL EMPLOYEES SET FORTH ELSEWHERE IN THIS SOLICITATION. FAILURE TO COMPLY WITH THESE PROVISIONS MAY CONSTITUTE SUFFICIENT CAUSE TO JUSTIFY NONSELECTION OF A PROPOSAL. THE TOTAL COMPENSATION PLAN REQUIRED TO BE SUBMITTED BY THE OFFEROR WILL BE VIEWED AS BEING WITHIN THE PURVIEW OF PUBLIC LAW 87-653 (FPR 1-3.807-3).

INSTRUCTIONS TO OFFERORS

(a) Total compensation (salary and fringe benefits) of professional employees under service contracts may, in some cases, be lowered by recompetition of these contracts. Lowering of compensation can be detrimental in obtaining the necessary quality of professional services needed for adequate performance of service contracts. It is, therefore, in the best interest of the Government that professional employees, as defined in 29 CFR 541, be properly and fairly compensated in these contracts. As a part of their proposals, offerors will submit a "Total Compensation Plan" (salaries and fringe benefits) for these professional employees for evaluation purposes.

(b) The Government will evaluate the Total Compensation Plan to ensure that this compensation reflects a sound management approach and an understanding of the requirements to be performed. It will include an assessment of the offeror's ability to provide uninterrupted work of high quality. The total compensation proposed will be evaluated in terms of enhancing recruitment and retention of personnel and its realism and consistency with a total plan for compensation (both salaries and fringe benefits).

(c) Criteria for evaluation, therefore, will include an assessment of the Total Compensation Plan submitted by each offeror.

7. RELEASE OF INFORMATION

Information pertaining to the proposals status will only be disclosed in accordance with Federal Procurement Regulations 41 CFR 1-3.103, Dissemination of procurement information.

8. TYPE OF CONTRACT ARRANGEMENT

It is the Government's normal practice to indicate the type of contract anticipated when contracting for services to be performed. However, since this Solicitation primarily involves the transfer of the Government's Landsat Satellite Systems, it is anticipated that the transition from Government to private ownership and operation will involve some considerable period of time. The terms and conditions of an actual sale are expected to be a part of a separate contract.

For the transition period, however, it is anticipated that a Cost Plus Fixed Fee (CPFF) contract, with appropriate incentive or award fee features included, may be the most appropriate type of contract arrangement, while the Government continues to own and the contractor operates the satellite facilities and systems.

In line with this concept, Section V includes clauses suitable for a CPFF contract to be used during the transition before ownership and operation by a private operator begins.

9. WIRE TRANSFERS OF PAYMENT

The Department of the Treasury has initiated a program to make contract payments by wire transfer through the Treasury Financial Communications System (TFCS). The objective of this program is to move toward the elimination of checks for vendor payments.

As of October 1, 1983, contractor payments in excess of $25,000 will be made by wire transfer, and payments of lesser amounts will continue to be made by check. This wire payment threshold is expected to be reduced as the program progresses.

If any payments under the resulting contract are requested at amounts which exceed $25,000, appropriate bank account information must be provided prior to payment. Bank account information will also be necessary when payments under the contract are less than $25,000 if other simultaneous billings result in a payment total in excess of $25,000, or if the Department of Treasury reduces its wire transfer threshold during the period of the contract.

To recognize the potential need for bank account information (for wire transfer payment purposes) and the extent of information required, the clause entitled Method of Payment is to be made part of the resulting contract. It is emphasized that the submitted bank account information will not be included in the contract.

SECTION IV INSTRUCTIONS FOR PROPOSAL PREPARATION

More specific information on how to prepare the proposal is contained here.

X X

Instructions for Proposal Preparation

Offerors shall submit proposals addressing all items as requested in this Section and conforming to the guidelines restrictions established here.

Proposals shall be submitted in four separately and properly identified volumes in the quantities indicated.

Volume	Title	Number Copies	Page Limitations
Volume I	Executive Summary	100 copies	20 pages
Volume II	Technical Performance Proposal (ref. Sec.VII)	20 copies	100 pages
Volume III	Commercialization Plan (ref. Sec.VIII)	20 copies	100 pages
Volume IV	Cost Proposal	10 copies	no limit

Elaborate brochures beyond that necessary to present an understandable and complete proposal are not required. Proposals shall be in loose leaf form and each volume shall be limited to the number of pages specified. Maximum page size is 8 1/2 x 11. (However, fold out pages may be used, where appropriate, but should not exceed 5% of the total pages.) Type size shall be not less than typewriter prestige elite. Illustrations, charts, etc. are included in the limitation total. A page is one side of a sheet of paper, i.e., 100 sheets printed on both sides equals 200 pages.

REFERENCE LIBRARY

In order to assist offerors in becoming familiar with the nature of this RFP and to gain as much historical insight as possible, a reference library has been established at 6010 Executive Blvd. (WSC5), Room 400, Rockville, Maryland. The library will be open on normal business days from 9:00 am to 4:00 pm.

TYPE OF CONTRACT ARRANGEMENT

A cost reimbursement contractual arrangement is anticipated for the Landsat satellite system, while the Government still retains ownership of the equipment, land and other facilities (transition period). After the transition period, the Government intends to buy Landsat data at unit prices under some form of Indefinite Quantity Contract arrangement. However, offerors may propose a fixed price or other business arrangement, consistent with law, for the Landsat operation performance for later operation, after the transfer to private ownership and operation of Landsat equipment and facilities has been completed.

CONTRACT DURATION

The Government consideration of acceptable contract durations is intended to cover a variety of acceptable proposals. The concept encompasses the cumulative times necessary to complete sequential stages of the commercialization process, based upon the following considerations:

The time to complete and sign a contract

The expected life of government systems operating at contract initiation.

The projected life span of government assets in pipeline if any, at contract initiation

A reasonable lead time for a private company to build and launch its own satellite system.

A required transition period to maintain continuity of operations and data delivery.

The need to negotiate and sign a follow-on contract with a reasonable lead time to build and launch satellite systems following the end of the initial contract.

The extended contract for Landsat could be as long as five years after contract signing to allow for launching the first non-government satellite with five years of follow-on operations.

A reasonable lead time to build and launch a new satellite system is as long as five years. Thus a contract duration of up to five years, after the end of transition is reasonable. Furthermore, a follow-on contract up to five years before the end of an initial extended contract is also considered reasonable.

A pictorial representation of these concepts is embodied in the date-time-lines shown in figure IV-1.

CERTIFICATE OF CURRENT COST OR PRICING DATA

The Government may require a certificate of current cost or pricing data to be submitted pursuant to 41 CFR 1-3. 807-4.

FACILITIES CAPITAL COST OF MONEY

In accordance with Federal Procurement Regulation Temporary Regulation 61, an offeror must specifically include in its cost proposal facilities capital cost of money in order for this cost to be considered an allowable cost. If you intend to claim facilities capital cost of money, your proposal must include Form CASB-CMF and DD Form 1861 as supporting documentation. The CASB-CMF indicates the basis for computing cost of money rates. The DD Form 1861 also indicates the facilities capital to be employed in performing the contract.

Cost Accounting Standard 414 (Cost of Money as an Element of the Cost of Facilities Capital) establishes criteria fior measuring and allocating the cost of money as an element of contract cost. Accordingly, your computations on Form CASB-CMF comply with the terms of this Standard. Contracts subject to the cost of money cost principle which are awarded to organizations failing to propose this cost will include the clause entitled "The contractor is aware that facilities capital cost of money is an allowable cost but waives the right to claim it under this contract.

CONTRACT CONCEPT

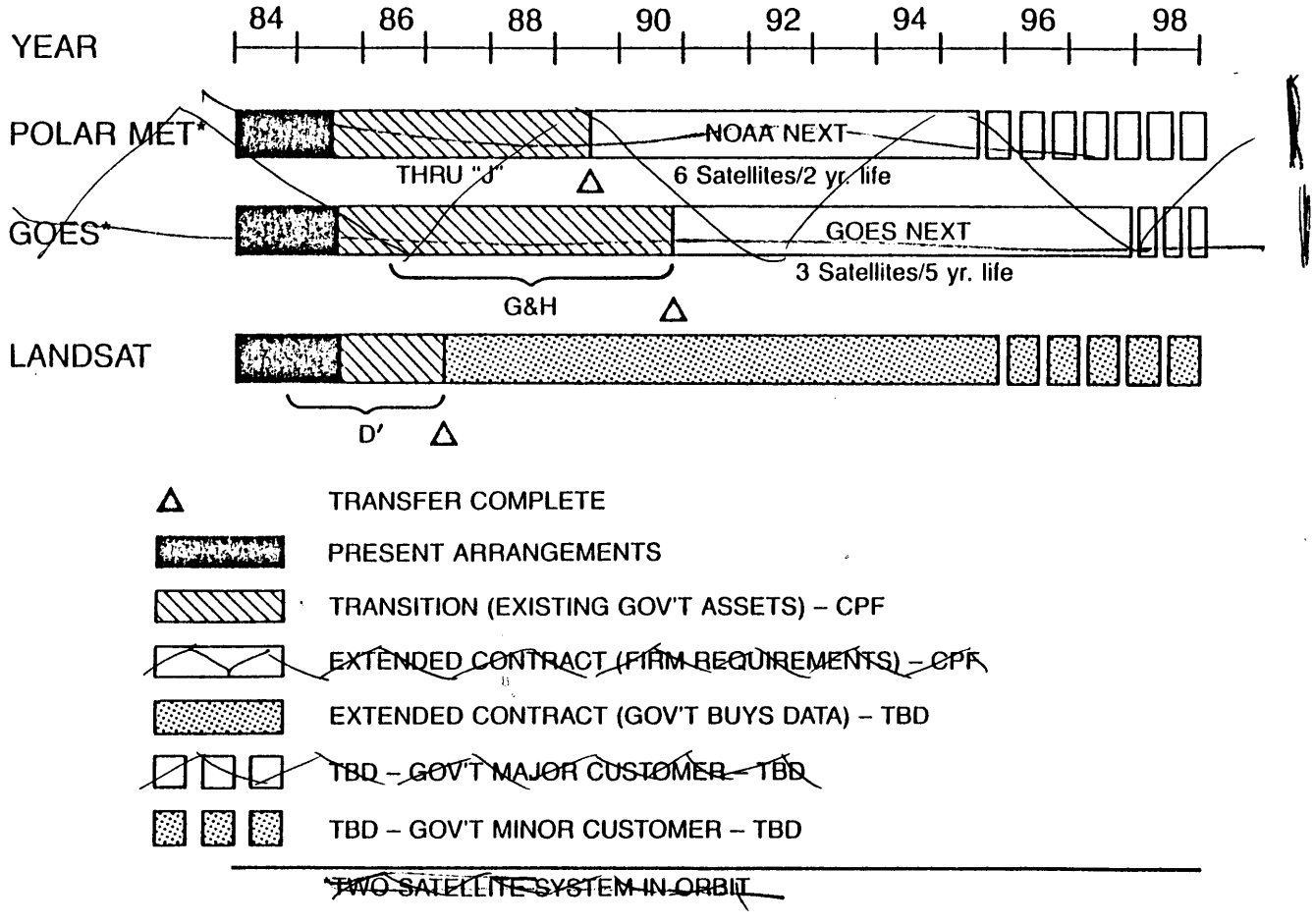

Figure IV-1

SECTION V CONTRACT SCHEDULE ARTICLES

The Government's normal procedure in a bidding situation is to include the terms and conditions (contract clauses) that will apply should a contract be awarded. However, since there are possible variations inherent in this solicitation, clauses for a Cost Plus Fixed Fee contract are the only clauses included. Clauses for other types of contracts will be substituted as appropriate in the actual contract.

SECTION V CONTRACT SCHEDULE ARTICLES

SECTION V

Contract Schedule Articles

ARTICLE I GOVERNMENT EMPLOYEES DISPLACED BY CONTRACT

Right of First Refusal for Employment Openings - Consistent with Government conflict of interest standards, the Contractor shall give Government employees displaced as a result of conversion to contract performance, the Right of First Refusal for employment openings on the contract in positions for which they are qualified.

ARTICLE II STATEMENT OF WORK

The Contractor, as an independent contractor and not as an agent of the Government, shall provide all qualified personnel, services, equipment, materials and facilities (not otherwise indicated Government furnished materials, equipment or facilities) to perform all of the work and provide the products and services and services set forth in Section VII Technical Requirements, as suplemented by the Contractor's proposal dated _____. In the event of any inconsistency between the Contractor's proposal, in whole or in part, as incorporated into the contract award document, and any other provisions of this contract, the contract provisions shall govern.

ARTICLE III COMMERCIALIZATION PLAN

Reserved. This article shall be inserted after negotiations.

The Government is interested in having Landsat become successful a commercial enterprise. Toward that end, this article shall contain specific contract requirements that will be agreed upon between the Government and successful contractors to carry out this effort.

ARTICLE IV PERIOD OF PERFORMANCE

The Contractor will perform all services and deliver all products and data for a period of 10 years. The system performance shall be for a period of ten (10) years inclusive of the remaining lifetime of Landsat D' at the time of transfer, estimated to be through calendar year 1986.

ARTICLE V UNITED STATES FIRM

(a) The Contractor understands and agrees that the Government will only contract with a United States firm. The Contractor certified in its proposal that it met the qualifications for a United States firm as defined in Section III.5 (a) of the RFP.

(b)

(1) It is essential for the Government to possess information about foreign ownership, control, or influence which is sufficient to enable it to determine whether the continued performance of the contract by a firm may have a significant adverse effect on the national security or public health and safety.

(2) For purposes of this clause, a foreign interest is defined as any of the following:

(A) A foreign government or foreign government agency;

(B) Any form of business enterprise organized under the laws of any country other than the United States or its possessions;

(C) Any form of business enterprise organized or incorporated under the laws of the U.S. or a state or other jurisdiction within the U.S. which is owned, controlled, or influenced by a foreign government, agency, firm, corporation, or person; or

(D) Any natural person who is not a U.S. citizen.

(c) Foreign ownership, control, or influence (FOCI) will be considered to exist when the degree of ownership, control, or influence over a contractor by a foreign interest is such that a reasonable basis exists for concluding that compromise of classified information or unclassified sensitive information may result.

(d) For purposes of this clause, subcontractor means any subcontractor at any tier. When this clause is included in a subcontract, the term Contractor shall mean subcontractor.

(e) The Contractor shall immediately provide the Contracting Officer written notice of any facts which would indicate a potential change in its status as a United States firm, or which are indicative of significant changes in the extent and nature of foreign ownership, control, or influence upon the Contractor. Further, notice of changes in ownership or control which are required to be reported to the Securities and Exchange Commission, the Federal Trade Commission, or the Department of Justice shall also be furnished concurrently to the Contracting Officer.

(f) In those cases where a Contractor has changes involving foreign ownership, control, or influence, the Contracting Officer must determine that the changes will not have a significant adverse effect on the public health

and safety or the national security. In making this determination, the Contracting Officer may consider proposals made by the contractor to avoid or mitigate foreign influences.

(g) If the Contracting Officer at any time determines that the Contractor is, or is potentially, subject to foreign ownership, control, or influence, the Contractor shall comply with such instructions as the Contracting Officer shall provide in writing to safeguard any classified information and unclassified sensitive information.

(h) The Contractor agrees to insert terms that conform substantially to the language of this clause including this paragraph (h) in all subcontracts under this contract that are expected to require access to classified information or unclassified sensitive information.

(i) The requirements of this clause are in addition to the requirement that a Contractor obtain and retain the security clearances required by the contract. This clause shall not oeprate as a limitation on the Government's rights, including its rights to terminate this contract.

ARTICLE VI METHOD OF PAYMENT

(a) Payments under this contract will be made either by check or by wire transfer through the Treasury Financial Communications System at the option of the Government. As of October 1, 1983, wire transfers will be used to process individual contract payment requests in excess of $25,000 or several concurrent payment requests in excess of $25,000. If the Department of the Treasury reduces this wire transfer threshold during the period of the contract, the Contractor will be advised accordingly. Bank account information required to accomplish wire transfers for the reduced threshold payments will then be required if not already provided.

(b) At the time of submitting the first invoice for payment in excess of $25,000, or the first request for several concurent payments which exceed $25,000, the Contractor is required to furnish with the invoice(s) the following bank account information:

(1) Name of the receiving bank.
(2) Address of the receiving bank.
(3) American Bankers Association (ABA) nine-digit identifier of the receiving bank.
(4) Telegraphic Abbreviation of the receiving bank.
(5) Contractor's account number at the bank.

If your bank does not have access to the Federal Reserve Communications System, do not complete item (3), but provide the following additional information:

(6) Name of the correspondent financial institution from which your bank receives electronic funds transfer messages.
(7) Address of the correspondent financial institution.
(8) Correspondent financial institution's nine-digit ABA identifier for routing the transfer of funds.

(9) Telegraphic abbreviation of the correspondent financial institution.

The person presenting this information should identify their title, sign and date the information, and present any additional information felt appropriate.

(c) Any changes to the information furnished under Paragraph (b) of this clause shall be furnished in writing to the appropriate finance office identified in the contract. It is the Contractor's responsibility to furnish these changes promptly to avoid payments to erroneous addresses or bank accounts.

ARTICLE VII GOVERNMENT-CONTRACTOR RELATIONSHIP

The Government and the Contractor understand and agree that the services to be provided under this contract by the Contractor to the Government are non-personal services. The parties recognize that no employer-employee relationship exists or will exist under this contract in accordance with the Department of Commerce Administrative Order 202-215 (Procurement of Services by Contract), effective April 27, 1967. The Contractor contracts with the Government to furnish the specified services fully described herein and is accountable to the Government only for furnishing such services, materials, or work produced, without being supervised. For the purpose of this contract, the Contractor shall not be subject to the supervision of a Federal office or employee while engaged in the performance of its duties.

ARTICLE VIII CONTRACT MANAGEMENT

Notwithstanding the Contractor's responsibility for total management responsibility during the performance of this contract, the administration of the contract will require maximum coordination between the Government points of contact during performance of the contract.

a. Contracting Officer's Technical Representative

A Contracting Officer's Technical Representative (COTR) will be designated on authority of the Contracting Officer to monitor all technical aspects and assist in administration of the contract. The types of actions within the purview of the COTR's authority are:

(1) assure that the Contractor performs the technical requirements of the contract;

(2) perform or cause to be performed inspections necessary in connection with performance of the contract;

(3) maintain both written and oral communications with the Contractor concerning the aspects of the contract within his purview;

(4) issue written interpretations of technical requirements of Government drawings, designs, and specifications;

(5) monitor the Contractor's performance under the contract and notify the Contractor and Contracting Officer of any deficiencies observed; and

(6) coordinate Government furnished property availability and provide for site entry of Contractor personnel if required.

A letter of designation will be issued to the COTR with a copy sent to the Contractor, stating the responsbilities and limitations of the COTR. This letter will clarify to all parties of this contract the responsibilities of the COTR. At no time may the COTR effect changes to the contract which would result in a modification to the scope of work; changes in cost or price totals or estimates; changes in delivery dates; or changes in any other mutually agreed upon term or provision of the contract.

ARTICLE IX COMPLIANCE WITH LAWS

The Contractor shall comply with all applicable laws and rules and regulations having the force of law which deal with or relate to performance hereunder or the employment by the Contractor of the employees necessary for such performance, and shall procure such permits, licenses and other required authorizations from the United States and from state and local authorities as may be necessary in connection with beginning or carrying on to completion of the contract work, and shall at all times comply with all United States, state and local laws in any way affecting the contract work.

ARTICLE X NOTICE TO THE GOVERNMENT OF DELAYS

In the event the Contractor encounters difficulty in meeting performance requirements, or anticipates difficulty in complying with contract delivery schedule or date, or whenever the Contractor has knowledge that any actual or potential situation is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately notify the Contracting Officer, and the Contracting Officer's Technical Representative, in writing, giving pertinent details, provided, that this data shall be informational only in character and that this provision shall not be contrued as a waiver by the Government of any delivery schedule or date or of any rights or remedies provided by law or under this contract.

ARTICLE XI HARMLESS FROM LIABILITY

The Contractor shall hold and save the Government, its officers, agents and employees, harmless from liability of any nature or kind, including costs and expenses to which they may be subject, for or on account of any or all suits or damages of any character whatsoever resulting from injuries or damages sustained by any person or persons or property by virtue or performance of this contract, arising or resulting in whole or in part from the fault, negligence, wrongful act or wrongful omission of the Contractor, or any subcontractor, his or their employees, agents, etc.

ARTICLE XII LIABILITY INSURANCE

The Contractor warrants that insurance (currently in force) exists in the following areas and amounts not less than those specified below:

Type of Insurance	Per Person	Property Coverage	Per Accident
1. Comprehensive General Liab.	$100,000	$10,000	$500,000/50,000
2. Automobile Liability	$100,000	$10,000	$500,000/50,000
3. Workmen's Compensation	$ As required by law at the job site.		

The Comprehensive General and Automobile Liability policies shall contain a provision worded as follows:

"The insurance company waives any right of subrogation against the United States of America which may arise by reason of any payment under the policy."

The Contractor shall file with the Contracting Officer within five (5) days after receipt notice of cancellation of or reductions below the above cited amounts any insurance coverge related to this requirement.

The Contractor warrants that such insurance coverage for all subcontractors who will work at any of the performance sites is in force.

ARTICLE XIII ENGINEERING CHANGE PROPOSALS

A. The Contracting Officer may at any time, in writing, request the Contractor to prepare and submit an Engineering Change Proposal (ECP) as that term is defined in MIL-STD-480, within the scope of this contract. Upon receipt of such request, the Contractor shall submit to the Contracting Officer the information specified by, and in the format required by paragraph 4 of MIL-STD-480.

B. Each Contractor ECP shall set forth a "not to exceed" cost and delivery adjustment, or a "not less than" cost and delivery adjustment, which will be acceptable to the Contractor if the Government subsequently orders the ECP. If ordered, the equitable increase shall not exceed, nor shall the equitable decrease be less than, such "not to exceed" or "not less than" amounts. Change Orders issued pursuant to the Changes clause of this contract shall not be considered an authorization to the Contractor to exceed the limitatin of Government funds amount in Article XXIII set forth in the schedule in the absence of a statement in the change order, or other contract modification, increasing the estimated cost. Concurrently with the submission of any ECP under this contract, the Contractor shall submit to the Contracting Officer a completed optional Form 60 or equivalent. At the time of agreement upon the cost of the ECP, the Contractor shall submit a Certificate of Current Cost or Pricing Data.

ARTICLE XIV INSPECTION AND ACCEPTANCE

Inspection and acceptance of the contract deliverables shall be made by the COTR and/or other representative specifically identified by the COTR.

The Government, through the COTR, has the right, at all reasonable times, to inspect, or otherwise evaluate the work performed or being performed hereunder and the premises in which it is being performed. If any inspection or

evaluation is made by the Government on the premises, whether Government owned facilities or not, the Contractor shall provide and shall require his subcontractors to provide all reasonable facilities and assistance for the safety and convenience of the COTR, or his representatives, in the performance of their duties. All inspections and evaluations performed will not unduly delay the work.

ARTICLE XV CONTRACTING OFFICER'S AUTHORITY

The Contracting Officer is the only person authorized to make or approve any changes in any of the requirements of this contract and notwithstanding any provisions contained elsewhere in this contract. The Contractor must obtain the approval of the Contracting Officer before making any changes at the direction of any other person. If this is not done, the change will be considered to have been made without authority and no adjustment will be made to the contract price to cover any increase in costs incurred as a result thereof.

ARTICLE XVI SUBCONTRACTING PLAN APPROVAL

The Subcontracting Plan submitted by _____ and dated _____ has been approved by the Government and is incorporated herein and made part of this contract. Any modifications to this contract or modifications in excess of $500,000 ($1,000,000 for construction) will require modification of the Subcontracting Plan.

ARTICLE XVII SUBCONTRACT REPORTS

The Contractor shall submit Subcontract reports in connection with the performance of this contract, a report for subcontracting under this particular contract and a summary report when applicable (See Paragraph b) on subcontracts in all contracts between the Contractor and the Department of Commerce which contain subcontract goals for awards to small business and small disadvantaged business concerns.

a. The Contractor shall submit a subcontracting report for this contract on Standard Form 294 (4-81). The report shall be submitted semi-annually in accordance with the General Instructions on the reverse side of the form. The report shall be submitted to:

Distribution	Addressee
copy	Contracting Officer
original	Department of Commerce The Office of Small and Disadvantaged Business Utilization (OSDBU) Washington, D.C.. 20230

b. The Contractor shall submit a summary subcontract report on all of its contracts with the Department of Commerce which have subcontracting goals on Standard Form 295 (4-81). The report shall be submitted quarterly in accordance with the General Instructions on

the reverse side of the form. The report shall be submitted no later than 15 days following the close of each calendar quarter. The report shall be submitted to:

Distribution	Addressee
original	Department of Commerce The Office of Small and Disadvantaged Business Utilizaation (OSDBU) Washington, D.C. 20230

ARTICLE XVIII WAGE DETERMINATION

In the performance of this contract the Contractor shall comply with the requirements of the U.S. Department of Labor Wage Determination Number _____ dated _____. (The Wage Determination is attached.)*

ARTICLE XIX TOTAL COST PLUS FIXED FEE**

The Contractor shall be reimbursed for costs incurred in the performance of work as are allowable and reasonable under the provision of Clause _____ of the _____ dated _____.

The Government shall pay to the Contractor a fixed fee for performance of all work in accordance with Clause _____ of the dated _____.

Estimated Cost	$_____
Fixed Fee	$_____
Total Cost Plus Fixed Fee	$_____

See Clause 23 Limitation of Government Funds.

ARTICLE XX CHANGEOVER

The Contractor may be replaced by a successor Contractor in the performance of the kind of effort required by this contract. The Contractor shall cooperate to effect an orderly and efficient transition to any such successor Contractor during a transition period to be specified by the Contracting Officer.

*To be inserted in the final Request For Proposals.
**If incentive fees or award fees are determined to be appropriate, the clause will be appropriately modified.

ARTICLE XXI DELIVERABLE ITEMS

ITEM	DESCRIPTION	SCHEDULE
1	Technical Reports	In accordance with Article XXXI.
2	Special Reports	In accordance with Article XXXI.
3	Financial Management Reports	In accordance with Article XXXI.
4	Government Property Reports	In accordance with Article XXXVIII.
5	Landsat Data	In accordance with Articles XLVIII & XLIX.

ARTICLE XXII SUBMISSION OF INVOICES FOR PAYMENT

The Contractor shall be reimbursed on a monthly basis upon submission of proper invoice. Submission of invoices for payment of costs and fee(s) shall be submitted separately, but shall include the total cumulative cost and fee(s) previously claimed and paid. In accordance with the provisions of the clause of this contract entitled "Allowable Cost, Fixed Fee, and Payment", vouchers and any required supporting statements or certificates, properly identifiable with the contract number, shall be submitted to the Contracting Officer, or his/her authorized representative as follows:

1 -- Original SF 1034, SF 1035, or equivalent Contractor's attachment
7 -- Copies SF 1034a, SF 1035a, or equivalent Contractor's attachment

Copies 1 through 5 of the SF 1034a shall be marked by insertion in the memorandum block the name and address of the following parties:

Each invoice for reimbursement shall detail the total vouchered charges by showing current and cumulative costs in the following manner:

Element of Cost	Total Dollar Amount Current Costs	Cumulative Costs
Direct Labor -- Engineering	$ -	$ -
Direct Labor -- Manufacturing	-	-
Total Direct Labor	$ -	$ -
Overhead -- Engineering	$ -	$ -
Overhead -- Manufacturing	$ -	$ -
Total Overhead	$ -	$ -
Raw Materials and Purchased Parts	$ -	$ -
Subcontract(s)	-	-
Travel	-	-
Computer	-	-
Facilities	-	-
Special Test Equipment	-	-
Other Direct Charges	-	-
G & A	-	-
Total	$ -	$

The above is the general illustrative format to follow. In the event no charges exist for any one of the line items, such shall be so indicated by entering $0 (zero dollars). Inability to reconcile the entries, with recorded Contracting Officer approvals, particularly in the areas of computer (ADPE acquisition), facilities, and special test equipment may result in the voucher being returned for correction and resubmission.

The fee shall be paid in installments based on the percentage of completion of work as determined by the Contracting Officer. Payment of the fixed fee will not be made in less than monthly increments. The fixed fee invoice shall state the period for which fee is claimed and shall indicate the percentage of completion of work required by the contract which has been completed, together with the basis used for computing the fee installment claimed.

An additional requirement is necessary to ensure the receipt of a proper invoice which, under the new wire transfer procedures, would have to include appropriate bank account information for payment requests in excess of $25,000.

Bank account information, as identified under the METHOD OF PAYMENT clause: For all first time individual contract payment requests in excess of $25,000; for first time submissions of several concurrent payment requests in excess of $25,000; or for lesser payment requests when advised in writing by the appropriate paying office.

Failure to provide all of the basic invoice requirements data will not only delay payment, but will also extend the starting point used in determining payment due dates established for purposes of computing interest penalties for late payments made under contracts covered by the Prompt Payment Act.

Payments of invoices shall be subject to the withholding provisions of the contract.

ARTICLE XXIII LIMITATION OF GOVERNMENT FUNDS

Pursuant to the clause of this contract entitled "Limitation of Government's Funds," total funds in the amount of $_____ are presently allotted and available for payment of allowable costs and fee estimated to be incurred from the date of this contract to _____ for all of the effort required under the contract. The terms fee and fixed fee in the clause shall be considered to include base fee and award fee if such are contained in the contract.

In addition to the requirements of the "Limitation of Government's Funds" clause, the Contractor shall notify the Contracting Officer in writing if at any time the Contractor has reason to believe that the total cost to the Government, exclusive of any fee, for the complete performance of this contract will be greater or substantially less than the then total estimated cost of the contract. Such notification shall give a revised estimate of the total cost for the performance of this contract.

ARTICLE XXIV CONTRACTOR FOREIGN TRAVEL

(a) Request for Department of Commerce sponsorship or financial support for Contractor, or subcontractor for foreign travel must be approved by the Contracting Officer. This approval will be granted when:

(1) the travel is clearly in the best interests of the Government;

(2) the appropriate COTR monitor concurs with the request; and

(3) approval is sought and received prior to initiation of each trip. (Prior trip approval is required even when the contract proposal anticipated a foreign travel requirement.)

(b) Foreign travel ordinarily will not be approved for:

(1) the sole purpose of visiting or attending meetings, unless fully warranted by clear and recognizable direct benefits for the project;

(2) meetings of national (as distinguished from international) bodies, unless the travel is constructively associated with other approved goals; or

(3) meetings that are predominantly American in either attendance or presented papers.

(c) The traveler must submit a trip report to the Contracting Officer.

(d) Travel which does not meet the conditions of paragraph (a) will be the responsibility of the traveler or his organization, and they will bear the costs of the trip.

ARTICLE XXV SEVERANCE PAY (ADVANCE UNDERSTANDING)

In addition to the provisions of Federal Procurement Regulation 41 CFR 1-15.205-39, it is agreed that upon termination or completion of this contract, employee severance pay shall not be charged to this contract when an employee voluntarily elects to stay in place and work for the succeeding Contractor.

ARTICLE XXVI CONTRACTOR CONDUCT WHILE ON GOVERNMENT PREMISES

The Contractor shall comply with the rules, regulations, and procedures governing the conduct of personnel and the operation of the facility. Such rules and regulations are generally set forth in Federal Property Management Regulations, 41 CFR 101-20.3.

ARTICLE XXVII OBSERVANCE OF LEGAL HOLIDAYS AND ADMINISTRATIVE LEAVE

The Government hereby provides "notice" and the Contractor hereby acknowledges receipt that Government observes the listed days as holidays:

New Year's Day	Labor Day
Martin Luther King's Birthday (starting in 1986)	Columbus Day
Washington's Birthday	Veterans' Day
Memorial Day	Thanksgiving Day
Independence Day	Christmas Day

Any other day designated by Federal statute
Any other day designated by Executive Order
Any other day designated by the President's proclamation

When any such day falls on a Saturday, the preceding Friday is observed; when any such day falls on a Sunday, the following Monday is observed. It is understood and agreed between the Government and the Contractor that observance of such days by the Government shall not "on-its-face" be cause for an additional period of performance, or entitlement of compensation except as set forth within the contract.

In the event the Contractor's personnel work during a holiday other than those above, no form of holiday or other premium compensation will be reimbursed as either a direct or indirect cost. However, this does not preclude reimbursement for authorized overtime work.

When the Department of Commerce grants administrative leave to its Government employees, Contractor personnel may also be dismissed. However, the Contractor agrees to continue to provide sufficient personnel to perform round-the-clock requirements of critical tasks already in operation or scheduled, and shall be guided by the instructions issued by the Contracting Officer or his/her duly appointed representative. In each instance when administrative leave is granted to Contractor personnel as a result of inclement weather, potentially hazardous conditions, explosions, or other special circumstances, it will be without loss to the Contractor. The cost of salaries and wages to the Contractor for the period of any such excused

absence shall be a reimbursable item of direct cost hereunder for employees whose regular time is normally direct charge, and a reimbursable item of indirect cost for employees whose regular time is normally charged indirect (in accordance with the Contractor's accounting policy).

ARTICLE XXVIII SAFETY AND HEALTH

1. In order to provide safety controls for protection to the life and health of employees and other persons; for prevention of damage to property, materials, supplies, and equipment, and for the avoidance of work interruptions in the performance of the contract; the Contractor shall comply with the safety, health, and fire protection policies and procedures of Federal, state and local jurisdictions.

2. Before the start of work, the Contractor will submit, in writing, to the Contracting Officer, (a copy shall also be sent to the Health, Safety, and Security Office), its plan for complying with the Safety and Health provisions of this contract, and will meet with the representative of the Contracting Officer to discuss and develop mutual understandings relative to administration of the overall safety program. Also to be considered in this plan is a requirement that the Contractor specify what reasonable means have been taken to assure that its employees are physically and psychologically capable of working at heights, such as climbing ladders and working on scaffolds.

3. The Contractor shall maintain an accurate record of, and shall report to the Contracting Officer or his/her designated representative in such manner as the Contracting Officer or his/her designated representative may prescribe all accidents and incidents resulting in death, traumatic injury, occupational disease and/or damage to property, materials, supplies, and equipment incident to work performance under the contract. Further, the Contractor shall take or cause to be taken such additional safety measures as the Contracting Officer may determine to be reasonably necessary provided that if compliance with such additional safety measure results in a material increase in the cost or time of performance of the contract, an equitable adjustment will be made in accordance with the clause of this contract entitled "Changes."

4. The Contracting Officer or his/her designated representative will notify the Contractor of any noncompliance with the provisions of this article and corrective action to be taken. The Contractor shall, after receipt of such notice, immediately take such corrective action. (Such notice, delivered to the Contractor or his/her representative at the site of the work shall be deemed sufficient for the purpose.) If the Contractor fails or refuses to comply promptly, the Contracting Officer or Contracting Officer's representative may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop work order shall be the subject of claim or extension of time or for costs or damages by the Contractor.

5. Compliance with the provisions of this article by subcontractors will be the responsibility of the Contractor.

6. For the purpose of this article, the Safety Officer, Health and Safety Engineering Office, is the designated representative of the Contracting Officer.

ARTICLE XXIX HANDLING OF GOVERNMENT DATA

It is anticipated that in performance of this contract, the Contractor may have access to and use of Government information and data bearing restrictive legends, including Government planning data which if released to third parties would give unfair business, technical, or competitive advantage. This data may be in various forms, such as documents, raw photographic films, magnetic tapes, photographic prints, computer printouts, or it may be interpretative results derived from analysis, investigative or study effort. Therefore, in furtherance of the Department of Commerce's data handling policies to protect the interests of other parties with respect to such information and data, the Contractor agrees:

(1) Not to use or copy any of this data and information, or derivatives thereof, for any purpose other than as may be necessary in the performance of this contract; and not to disclose it to others, including other organizational elements of the Contractor not directly involved in the performance of this contract, without the written consent of the Contracting Officer or until such time as the Government may have released such information and data to the public; and

(2) To abide by the conditions of restrictive legends contained on any such data.

The Contractor will establish policies and procedures to implement the substance of this Article at the individual employee level which will assure that affected employees are made aware of the contract provision and the Contractor's implementing policies and procedures. Particular attention will be given to keeping employees advised of statutes and regulations applicable to the handling of other Contractor's proprietary, business confidential or financial data.

This Article does not preclude the Contractor and/or its employees from independently acquiring and using business confidential or financial data from legitimate sources outside this contract, or from performing and using independent analysis or data so acquired, provided that the Contractor and/or its employees fully document the source of such data, and the independence of any such analysis.

The Contractor will insert the substance of this Article in each subcontract hereunder (other than for purchase of supplies or equipment), unless the Contracting Officer has waived this requirement in writing as to particular subcontracts or classes of subcontracts.

ARTICLE XXX REPORTS

A. Technical Reports

The Contractor shall prepare and submit a Monthly System Status Report (MSSR) describing the operational status of those portions of the system capable of supporting the Government requirements. The purpose of this report is to enable an assessment by the Government of any threats to system continuity and to assist in evaluation of Contractor performance. Exact content of the MSSR is to be specified and the offeror shall describe a proposed format in the proposal. The report shall not generally exceed 10 pages and be sent to the COTR with a copy to the Contracting Office.

B. Special Reports

The Contractor, at the written request of the Contracting Officer or his designated representative, shall prepare and submit such special reports as may be required in support of work within the scope of this contract. The reports shall be prepared in the format(s) specified in and distributed in accordance with instructions set forth in the request.

C. Financial Management Reports

The Contractor shall prepare, use, and submit Financial Management Reports on NASA Form 533M and Form 533Q.

ARTICLE XXXI COLLECTIVE BARGAINING AGREEMENT

The Contractor shall provide the Contracting Officer with copies of any collective bargaining agreements, and any amendments thereto, which arise during the course of this contract and which apply to Contractor employees working under this contract. In addition, the Contractor shall provide a "cents per hour" equivalency cost for each fringe benefit included in such bargaining agreements, including any prospective increases in same.

Furthermore, prior to the expiration of this contract, and in anticipation of solicitation of a follow-on contact, the Contracting Officer shall request, and the Contractor shall provide, a copy of the current collective bargaining agreement, any amendments thereto, and the curent "cents per hour" equivalency cost for each fringe benefit included in the collective bargaining ageement, including any prospective increase in same.

ARTICLE XXXII COOPERATION WITH OTHER CONTRACTOR PERSONNEL

It may be necessary in fulfilling the requirements of operating Government facilities that Contractor personnel at the site, other than those of the Contractor, may be required to operate specialized items of equipment or to assist in critical operational periods. The Contractor will extend fullest cooperation to other Contractor personnel required for such operations.

ARTICLE XXXIII IDENTIFICATION OF EMPLOYEES

During the performance of this contract, the rights of ingress and egress to and from Government facilities for Contractor representatives shall be made available as required. In this regard, all Contractor personnel whose duties under this contract require their presence shall be clearly identifiable by a distinctive badge furnished by the Government. The obtaining of the badge is the sole responsibility of the Contractor. Federal Propert Management Regulations provide instructions in this regard. All prescribed identification shall immediately be delivered to the Department of Commerce for cancellation or disposition upon the termination of employment of any Contractor personnel. Contractor employees must have this badge in their possession during normal working hours and for showing upon request. After hours (6 p.m. to 6 a.m.) all personnel must wear the badge in plain view.

ARTICLE XXXIV ACCESS TO GOVERNMENT PROPERTY

Some or all of the work effort required to be accomplished under this contract may be performed at a Government site. The Contractor, therefore, will be granted ingress and egress at the specified site where the work is to be performed.

While Contractor personnel are at the Government site, they are required to comply with all rules and regulations of the site, specific mention being made of complying with rules and regulations governing conduct with respect to health and safety not only as they relate to themselves but also to other personnel who are Government employees or agents of the Government and to property at the site regardless of whether or not title to such property vests with the Government.

The accountability of the property to which the Contractor has access will remain with the Government and will not be considered "Government Property" furnished to the Contractor.

The Government property to which the Contractor will have access under this Article will be made available during the period of performance. In the event the property to which the Contractor is to have access is not made available as scheduled, the Contracting Officer shall, upon timely written request made by the Contractor, make a determination of the delay, if any, occasioned the Contractor thereby, and shall equitably adjust the delivery or performance dates or the contract cost and fee, or both, and any other contractual provision affected by any such delay, in accordance with the procedurs provided for in the clause of this contract entitled "Changes."

ARTICLE XXXV SECURITY REQUIREMENTS (ON-SITE)

All Contractor personnel assigned to the proposed contract shall have an appropriate level of security clearance. From time to time a requirement for a security clearance of up to "top secret" may be placed on particular Contractor's employees. The Contractor shall be responsible for compliance by its employees with the security regulations of other Government or industrial installations where work is performed under this contract, including the safekeeping, wearing and visibility of badges while on Government premises.

ARTICLE XXXVI FACILITIES TO BE ACQUIRED/FABRICATED

Approval of the Contracting Officer shall be obtained before purchase/fabrication (under this contract) of any equipment which is considered to be "Facilities." This approval shall be obtained before submission for any required subcontract consent.

ARTICLE XXXVII FINANCIAL REPORTING OF GOVERNMENT-OWNED/CONTRACTOR-HELD PROPERTY

Pursuant to the clause in the Additinal General Provisions -- Supplement AP-17, Government Property, the Contractor shall provide an annual report on the anniversary date of the contract award.

ARTICLE XXXVIII ACQUISITION OF MOTOR VEHICLES

The Contractor shall obtain the approval of the Contracting Officer before the Contractor or any lower tier subcontractor acquires any motor vehicles by purchase or commercial lease (6 months or more), where the cost will be charged as a direct item of cost to the contract. The Contractor's request for approval shall be in sufficient detail to substantiate that the proposed purchase or lease selected is the least expensive means of transportation consistent with the conduct of business under subject contract. As a minimum submit the following:

(i) the number of vehicles proposed;
(ii) the type (sedan, truck, ambulance, etc.);
(iii) size (compact, subcompact, class of truck, etc.);
(iv) detailed description of intended use, with justification;
(v) cost of lease;
(vi) a copy of the lease, if available; and
(vii) the name and phone number of the person to contact for additional information which may be required.

ARTICLE XXXIX SUBCONTRACT MANAGEMENT

(a) Unless otherwise provided within this contract, the Contractor will be responsible for selecting subcontractors and effectively managing the subcontracts required in the performance of work hereunder. The Contractor will apply special management emphasis on the performance of critical subcontractors to provide reasonable assurance that contractual requirements will be met. In discharging this responsibility, the Contractor will establish, maintain, and use in the performance of this contract a subcontract management system that conforms to the minimum criteria set forth below. Specifically, the Contractor will:

(1) Before the award of the subcontracts, identify all subcontractors critical to the successful performance of this contract (that is, where performance significantly impacts the price or technical requirements or delivery schedule) and notify the Contracting Officer of this identification in writing indicating the areas and degree of risk involved. For the subcontracts clause of this contract, identification of the critical subcontractor will be included in such notice. The Contractor will include additional subcontractors identified as critical by the Contracting Officer. Subcontractors

may be dropped, with the concurrence of the Contracting Officer, from the special management emphasis category when they are no longer viewed as critical.

(2) Require the critical subcontractors to identify at regular time intervals existing and potential technical, cost (when appropriate) and schedule problems and to propose solutions for their resolution. This would include devising work around solutions for risks which become unacceptable. The Contractor will promptly notify the Contracting Officer of the problems and proposed solutions for risks which become unacceptable.

(3) Ensure that each subcontract contains all applicable specifications, special requirements, and clauses needed to carry out the requirements of the prime contract.

(4) Select a contract type appropriate to the risks involved in the performance.

(5) Consistent with obtaining reasonable competition, plan solicitation, and evaluation of subcontractor proposals to minimize expense.

(6) Wherever feasible, encourage subcontractor to submit alternate proposals; for example, use of off-the-shelf hardware to meet a contractual requirement instead of new development.

(7) Perform advance procurement planning for each critical subcontract. Respond, in writing, to reasonable requests of the Contracting Officer for information on procurement planning before the solicitation is released.

(8) Provide prompt notification to the Contracting Officer when a problem that is likely to have a significant adverse impact on technical, cost, or schedule develops on a critical subcontract.

(9) Within the Contractor's responsibility for the technical performance of subcontracts, provide technical assistance to critical subcontractors for problem-solving when required.

(10) Establish a requirement for program reviews with critical subcontractors and periodically invite authorized representatives of the Contracting Officer to attend these reviews. The Contractor will also invite authorized representatives of the Contracting Officer to attend design reviews and problem-solving meetings as an observer.

(11) Include a provision in all subcontracts authorizing the Contracting Officer or his representative to visit the subcontract facilities (with the concurrence of the Contractor) to review progress and witness testing pertaining to the requirements of the subcontract.

(12) Provide adequate information in response to reasonable requests of the COTR or his authorized representative on subcontract performance as required.

(13) Submit status information for critical subcontractors in program progress reporting that is specified in other provisions of this contract.

ARTICLE XL COMPUTER UTILIZATION AND PROGRAMMING

The Contractor shall not use any Government general-purpose computers without prior approval of the COTR or his representative. In this case, approval must be requested from the Contracting Officer, in writing, through the COTR. Application for use of Government computer facilities shall substantiate the qualifications of Contractor personnel to use the facilities. All Contractor personnel who will use general-purpose computers must be registered through the use of Department of Commerce procedures.

All programs must be adequately documented. The procedures for documentation of programs for general-purpose computers are given in NOAA Operations Data Processing Facility Computer Software Standards and Guidelines USDOC/NOAA/NESS, 12/1976.

All programs must be adequately protected from fire and other possible loss. Adequate protection is provided by storing a program and its copy in different buildings.

ARTICLE XLI SYSTEMS AND RECORDS DEVELOPMENT

All systems, procedures, records, reports, historical data, etc., developed under this contract, will be the property of the Contractor, except that the Government shall be granted a non-exclusive, royalty free, limited right to use all such material necessary for continued operation and maintenance of the system as long as the Contracting Oficer determines necessary. This limited right will continue if operation and maintenance of the system becomes necessary by the Government or by a successor contractor. The Contractor shall ensure that the Contracting Officer, or the COTR, at all times has up-to-date copies of all documentation necessary to maintain and operate the system.

ARTICLE XLII CONTRACTOR'S POLICIES AND PROCEDURES

In the event that during the term of this contract the Contractor shall make modification(s) and/or change(s) to any of the below-listed policies and procedures, the Contractor shall furnish copies thereof with explanatory comments to the Contracting Officer.

1. Vacations
2. Holidays
3. Sick Leave
4. Other Leave
5. Bonus Plans
6. Incentive Plans
7. Location Allowance
8. Per Diem, Subsistence, and Travel Allowances
9. Severance Pay
10. Overtime and Shift Premium Payments
11. Relocation Allowances

ARTICLE XLIII COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

In that this contract involves the use of Government-owned facilities and/or equipment, performance of work hereunder shall comply with the provisions of the Occupational Safety and Health Act of 1970, as amended (OSHA).

If at any time during the performance of this contract the Government-furnished facilities and/or equpment do not conform to the OSHA standards, notification in writing of the defects shall be made to the Contracting Officer and a copy of the notification shall be sent to the Health, Safety, and Security Office.

ARTICLE XLIV WORK AREA SEARCHES

a. The Contractor shall require his senior line officials in each facility to familiarize themselves with the emergency procedures of the facility in which Contractor personnel will be working. The Contractor lead official will appoint wardens as required in order to provide for smooth and rapid evacuation of the facility. The Contractor lead official shall advise all Contractor employees of the possibility they may, in emergency situations, be asked to volunteer to search areas occupied by Contractor personnel.

b. No additional cost shall be charged the Government for this effort, and the Contractor shall not be penalized for the normal daily work not accomplished which was otherwise scheduled.

ARTICLE XLV TRAINING OF CONTRACTOR PERSONNEL

All formal training and courses which are directly charged against this contract must be approved in advance by the Contracting Officer. Requests for training must be submitted to the Contracting Officer at least 30 days before the start of the course. The request must contain the name of the course, the training facility, and the total cost of the training. Each request shall be evaluated on the basis of relevance to job classification, cost consideration, and funding available. The Contractor shall not proceed without written approval from the Contracting Officer.

ARTICLE XLVI INSPECTION SYSTEM (SUBCONTRACTS)

The Contractor shall invoke adequate inspection system requirements on subcontractors and suppliers to ensure the required quality of materials, parts, components, and services for end-use in this program. Monitoring of the Contractor's system for inspecting subcontractors will be accomplished through the combined efforts of Government personnel and the delegated Government agency. The authority and responsibility of the delegated agency will be defined in a Letter of Contract Administration Delegation.

ARTICLE XLVII LANDSAT SATELLITE SYSTEM DELIVERABLE ITEMS

If the Contractor becomes the owner/operator of the Landsat satellites system, this clause will apply during the transition period. The Contractor shall deliver, in the manner described and at the times and places set forth in Section VII -- Technical Requirements, Landsat imagery data with "TM or MSS." Beyond the transition, deliverables will be set forth in the contract, based on the successful proposal.

NOTE: THE FOREGOING CLAUSES IN THIS SECTION, AS WELL AS THE GENERAL AND ADDITIONAL GENERAL PROVISIONS IN SECTION VI, ARE THOSE WHICH WOULD APPLY TO THE TRANSITION PERIOD. CLAUSES WHICH WOULD BE INCLUDED IN A CONTRACT TO TRANSFER ANY SYSTEM(S) ARE DEPENDENT UPON THE SUBSTANCE OF THE SUCCESSFUL PROPOSAL AND THE NECESSARY LEGISLATION AUTHORIZING THE TRANSFER.

SECTION VI GENERAL AND ADDITIONAL GENERAL PROVISIONS

These are the pre-printed clauses that will apply to any Cost Plus Fixed Fee contract that might be awarded.

SECTION VI

GENERAL AND ADITIONAL GENERAL PROVISIONS

INCORPORATION OF CONTRACT CLAUSES BY REFERENCE

The following clauses are hereby incorporated in this contract by reference with the same force and effect as if set forth in full:

(X) those clauses required by the Federal Procurement Regulation enumerated in the attached list;

(X) other clauses prescribed by Federal Procurement Regulation for use "When Applicable" as are checked below; and

(X) other clauses checked.

Availability of text of Clauses -- The complete text of all caluses may be obtained from the U.S. Department of Commerce, Source Evaluation Board for Civil Space Remote Sensing, Room 300, 11420 Rockville Pike, Rockville, Maryland 20852.

U.S. DEPARMENT OF COMMERCE

COST REIMBURSABLE (SERVICES)

The provisions set forth herein are applicable to this contract except that those provisions preceded by a ( ) are applicable only if checked.

GENERAL PROVISIONS -- REQUIRED

	NO.	CLAUSE TITLE	FPR CLAUSE NO.
	1.	Definitions	1-7.102-1
	2.	Changes	1-7.202-2
	3A.	Limitation of Cost (Fully Funded)	1-7.202-3(a)
(X)	3B.	Limitation of Funds (Incrementally Funded)	1-7.202-3(b)
	4.	Allowable Cost, Fixed Fee, and Payment	1-7.202-4(a)
( )	5A.	Inspection of Supplies and Correction of Defects	1-7.202-5
(X)	5B.	Inspection of Services	DAR 7-1909.5
	6.	Assignment of Claims	1-30.703
	7.	Examination of Records by Comptroller General	1-7.103-3
	8.	Subcontracts	1-7.202-8
	9.	Termination for Default or for Convenience of the Government	1-8.702
	10.	Excusable Delays	1-8.708
	11.	Disputes Clause	FPR Temp Reg 55
	12.	Buy American Act Supply and Service Contract	1-6.104-5
	13.	Convict Labor	1-12.204
	14.	Contract Work Hours and Safety Standards Act -- Overtime Compensation	1-12.303
	15.	Walsh-Healey Public Contracts Act	1-12.605
	16.	Equal Opportunity	1-12.803-2
	17.	Officials Not to Benefit	1-7.102-17
	18.	Covenant Against Contingent Fees	1-1.503
	19.	Notice and Assistance Regarding Patent and Copyright Infringement	1-7.103-4
	20.	Utilization of Small Business Concerns and Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals	FPR Temp Reg 50
	21.	Utilization of Labor Surplus Area Concerns	1-1.805-3(a)
	22.	Competition in Subcontracting	1-7.202-30
	23.	Employment of the Handicapped	FPR Temp Reg 38
	24.	Clean Air and Water Act	1-1.2302-2
	25.	Disabled Veterans and Veterans of the Vietnam Era	FPR Temp Reg 39

LIST OF FPR "WHEN APPLICABLE" CLAUSES FOR COST REIMBURSABLE (SERVICES) CONTRACTS

	CLAUSE NO.	CLAUSE TITLE
(X)	1-3.814-1(a)	Price Reduction for Defective Cost or Pricing Data -- AP-7
(X)	1-3.814-1(b)	Price Reduction for Defective Cost or Pricing Data -- Price Adjustment -- AP-7
(X)	1-3.814-2(a)	Audit and Records -- AP-7
(X)	1-3.814-3(a)	Subcontractor Cost or Pricing Data -- AP-7
(X)	1-3.814-3(b)	Subcontractor Cost or Pricing Data -- Price Adjustment -- AP-7
(X)	1-7.203-3	Notice to Government of Labor Disputes -- AP-4
(X)	1-3.704	Negotiated Overhead Rates -- AP-16
(X)	1-7.203-15	Interest -- AP-4
(X)	FPR Temp Reg 50	Small Business and Small Disadvantaged Business Subcontracting Plan (Negotiated) -- AP-9
( )	FPR Temp Reg 50 (Sup. 2)	Incentive Subcontracting Program for Small Business and Small Disadvantaged Business (Negotiated) -- AP-9
(X)	1-1-805-3(b)	Labor Surplus Area Subcontracting Program -- AP-9
(X)	FPR Temp Reg 54	Utilization of Women-Owned Business Concerns -- AP-6
(X)	FPR Temp Reg 54	Women-Owned Business Concerns Subcontracting Program -- AP-9
(X)	1-7.203-21(a)	Government Property -- AP-17
( )	1-7.203.21(b)	Government Property -- AP-17
( )	1-7.402.7(d)	Government Property (Non Profit) -- AP-17
( )	1-7.402.7(a)	Government Property -- AP-17
(X)	1-3.1204-1(b)	Administration of Cost Accounting Standards -- AP-8
(X)	1-3.1204-2(a)	Cost Accounting Standards -- Non Defense Contracts -- AP-8
(X)	1-3.1204-2(b)	Consistency of Cost Accounting Practices -- Non Defense Contracts -- AP-8
( )	1-1.327-5	Privacy Act -- AP-4
( )	1-19.108-2	Use of U.S. Flag Commercial Vessel -- AP-4
(X)	DOC Provision	Organizational Conflict of Interest -- AP-5
(X)	DOC Provision	Gratuities -- AP-14
( )	1-19.302	F.O.B. Origin -- AP-20
( )	1-19.306	F.O.B. Destination -- AP-20
(X)	1-12.904-3	Fair Labor Standards Act and Service Contract -- Price Adjustment -- AP-21
( )	DAR 7-1905(c)	Fair Labor Standards Act and Service Contract Act -- AP-21
(X)	1-12.904-1	Services Contract Act of 1965, as amended -- AP-19

ADDITIONAL CLAUSES -- if desired to cover the subject matter

	CLAUSE NO.	CLAUSE TITLE
(X)	1-7.204-5	Insurance Liability to Third Person -- AP-11
(X)	DOC Provision	Contracting Officer's Technical Representative (COTR) -- AP-6
(X)	DOC Provision	Access to Records and Right to Audit -- AP-14
(X)	DOC Provision	Overtime -- AP-12
(X)	DOC Provision	Subcontracting and Services of Consultants -- AP-12
( )	DOC Provision	Insurance -- AP-12
( )	DOC Provision	Contract Fund Limitation -- AP-12
( )	DOC Provision	Dissemination of Contract Information -- AP-14
( )	DOC Provision	Collection of Information -- AP-14
( )	DOC Provision	Printing -- AP-13
( )	DOC Provision	Changes -- AP-14
( )	DOC Provision	Rights in Data -- AP-5
( )	DOC Provision	Rights in Technical Data -- AP-5
( )	DOC Provision	Data Requirements -- AP-5
( )	DOC Provision	Authorization and Consent -- AP-14
( )	DOC Provision	Consultant or Other Comparable Employment Services of Contractor Employees -- AP-12
(X)	DOC Provision	Key Personnel -- AP-13
(X)	1-7.404-5	Changes

SECTION VII TECHNICAL REQUIREMENTS

This Section is the statement of work, i.e., what is required to be performed, how and when, etc. This is the heart of the Solicitation.

D. Dissemination of R&D Results

Commercialization should not alter Government policy with regard to the publication and presentation of research results. As a general rule, it is Government policy to report the results of sponsored research acitvities in an expeditious fashion. However, depending upon the nature of the specific agreement between the parties, the results of particular Government-funded research efforts may or may not be in the public domain. While commercial operators should seek to remain abreast of current research, they should not assume that award of a contract resulting from this RFP will provide them with any special access to research results not available to other firms.

6.6 Proposal Requirements

Proposals in response to this Solicitation, shall address:

A. Methods and procedures for ensuring that operational remote sensing data will be available on a timely basis for U.S. Government research programs and that such data will be available to be distributed;

B. A detailed description of the follow-on system to meet (fulfill) the stated government data requirements. This description shall outline the spacecraft/sensors contemplated; the development schedule; launch considerations; and effects, if any on the government's use of the data (computers, software, personnel, etc.);

C. A description of proposed changes, if any, to the system ground configuration including location, hardware and software changes; operating procedures; effects, if any, to the government's data processing procedures and equipment;

D. The type and areas of contractor R&D for system improvements;

E. The methods and procedures for incorporation of R&D sensors and space systems developed by the Government. Included in this section shall be a description and plan of how government R&D sensors and systems might be flown on the commercial spacecraft; and

G. The proposal shall address the understanding of the needs and purposes of remote sensing data for R&D and the approach to provision of operational data for research. Of particular interest is the proposed approach to:

Section VII
Technical Requirements

1.0 Introduction

The government has a number of technical requirements for data or services provided by operational civil remote sensing satellites. These are described below.

The Landsat satellite system provides information about the condition of the earth's surface by a process of sensing radiation from objects on the earth. Landsat 4, launched July 16, 1982, carries a new sensor, the Thematic Mapper (TM) which, for the first time, provides 30m data. To provide continuity of data with previous Landsats, the Multi-Spectral Scanner (MSS) which provides 80 m resolution was also deployed on Landsat 4. Both TM and MSS will also be deployed on Landsat D'.

On November 16, 1979, the President assigned to the National Oceanic and Atmospheric Administration (NOAA) the management responsibility for civil operational land remote sensing. Operational control of the MSS was turned over to NOAA on January 31, 1983. However, due to the experimental nature of the TM, operational turnover of this sensor is not planned until early 1985.

The current Landsat system was designed as an experimental system and consequently does not meet operational performance standards. It includes no satellites after Landsat D'.

1.2. Scope. This solicitation defines technical requirements for the commercialization of the DOC land observing satellites, together with the associated ground systems for each including tracking, data acquisition, data recovery and preprocessing to Government standards.

For purposes of this solicitation a satellite system is defined to include the following functions and components:

- o Satellite bus including telemetry, power, attitude control and communications;
- o Spaceborne sensors, instruments and data systems
- o Launching provisions and launch vehicle services
- o Tracking, command and control and space/ground communications; and
- o Data pre-processing to geographically located geophysical units and computer-compatible tape (CCT) and/or master film images calibrated and quality checked.

Acceptable proposals shall provide for all functions and components of the system. Proposals for individual components or functions of the system are not acceptable: however, subcontracting is encouraged where appropriate.

1.3. Functional Elements. The principal functional elements of the system are:

a. Landsat satellites--Landsat 4 and D'
b. Satellite system command and control and data preprocessing at Goddard Space Flight Center
c. Satellite tracking and data communications via TDRSS and/or other ground systems
d. Data processing and distribution at EROS Data Center.
e. Associated ground communication system.

1.4. Operational Responsibilities. The system(s) and procedures provided by the contractor to fulfill the above functions shall comply with all aspects of foreign policy and National Security, and should provide for the orderly development of replacement systems for data continuity and efficiency. These are given in detail in the discussion that follows in this section (Section VII) and Appendix A.

VII-2 APPLICABLE DOCUMENTS

The following list of reference materials will be available in the NOAA Reading Room, 6010 Executive Boulevard (WSC-5), Room 412, Rockville, Maryland. If copies of documents are desired, a charge of $.07 per page will be necessary to defray the copying cost (unless the document is generally available to the public such as a NOAA Technical Memorandum). The hours for the Reading Room will be 9:00 A.M. to 4:00 P.M., Monday through Friday. Further information on the reading room may be obtained by calling Mr. Byron Bailin at (301) 443-3925.

SEB Reference Number	
300	The Landsat System
301	Landsat-4 Flight Segment Specification, SVS 9934
302	Landsast-4 to Ground Station Interface Description, 435-D-400
303	Landsat-4 Ground Segment Specification, GES 10045
304	Landsat -D Ground Segment Maintenance and Operation Manpower Requirements Plan, SDS 4248
305	Landsat-D Ground Segment Specification for the Control and Simulation Facility, GES 9838
306	Landsat-D Ground Segment Specification for the Mission Management Facility, GES 10062
307	Landsat-D Ground Segment Image Generation Facility Data Retrieve, Record and Transmit Subsystem (DRRTS) Specification, GES 10028
308	Landsat-D Ground Segment Multispectral Scanner Image Processing System (MIPS) Specification, GES 10027
309	Landsat-D Ground Segment Facility Requirements Document for the Transportable Ground System, SVS 9941
310	Master Interface Control Document
311	Goddard HDT Inventory Tape - Partially Corrected MFS Data (GHIT-AM)
312	Landsat D Ground Segment Management Plan
313	Landsat D Ground Segment Mission Control and Operations Plan
314	Image Acquisition and Standing Orders for Thematic Mapper and Multispectral Scanner Data
315	Partially Processed Multispectral Scanner High Density Tape (HDT-AM)
316	Thematic Mapper High Resolution 421mm film
317	Information and Data Transfer Technical Specification
318	Execution Phase Project Plan for Landsat D/D'

Number	
319	Landsat-D Ground Segment Design Description
320	NOAA Landsat Operations to Networks Directorate Interface Control Agreement
321	MOU between NASA and NOAA for the Transition of Landsat D/D' Operations from NASA to NOAA
322	Landsat D Ground Segment to Networks Interface Control Document
323	MOA between NOAA and USGS for the Provision of Landsat Data Products and Services by the EDC
324	Landsat-D Data Format Control Book, Volumes I through VI
325	MMF/MIPS/DRTS ICD
326	CSF/MMF ICD
327	Landsat-D Ground Segment Control Point Management Plan
328	Landsat-D Ground Segment Imaging System Performance
329	Landsat-D Ground Segment Logistic Plan
330	Landsat-D Ground Segment Mission System Activation Plan
331	Landsat-D Ground Segment Training Plan forl the Maintenance and Operations Staff
332	Landsat-D Responses to Spacecraft Questionnaire
333	Landsat-D Ground Segment Hardware/Software Maintenance Plan
334	Landsat-D Ground Segment Operational Configuration Management Plan
335	ITEM Development Specification for the Flight Scheduling Subsystem of the Landsat-D Control and Simulation Facility
336	Landsat-D Ground Segment Facility Requirements Document for the Operations Control Center and the Data Management
337	Landsat-D Instrument Module to Thematic Mapper Interface Control Document
338	Landsat D Instrument Module to Global Positioning System Receiver/Processor Assembly Interface Control Document

SEB Reference Number	
339	Landsat-D Ground Segment to Tape Support Facility Interface Control Segment
340	Landsat-D Ground Segment to Project Office Interface Control Document
341	Landsat-D Ground Segment to NOAA (National Weather Service) Interface Control Document
342	Landsat-D Ground Segment Operational Quality Assurance Plan
343	Landsat-D Ground Segment Software Management Plan
344	Landsat-D Ground Segment Equipment and Facility Grounding Specification
345	Landsat-D Instrument Module to Wideband Communications Subsystem Interface Control Document
346	Landsat-D Ground Segment to Orbit Computation Group Interface Control Document
347	Landsat-D Ground Segment to Photo/Shipping Support Facility Interface Control Document
348	Landsat-D Orbit Adjust Criteria
349	Landsat-D Ground Segment to Building 23 (DOMSAT Interface Facility)
350	Landsat-D Ground Segment Mission facility MSS to Mission Management Facility-TM
351	The Landsat System-Orientation Program Overview

SEB Reference Number

500 General

505 A Study to Examine the Mechanisms to Carry Out the Transfer of Civil Land Remote Sensing Systems to the Private Sector, Prepared for U.S. Department of Commerce by Earth Satellite Corporation and ABT Associates, Inc., March 28, 1983

506 Letter Report from U.S. Department of Justice Re: Commercialization of Civil Operational Earth-Observing Satellite Systems, August 25, 1983

507 NOAA Satellite Programs: A Briefing, August 1983

508 Statement of Secretary of Commerce Malcolm Baldridge Before the Subcommittee on Natural Resources, Agriculture, Research and Environment and the Subcommittee on Space Science and Applications of the Committee on House of Representatives on Science and Technology, April 14, 1983.

509 Statement of Raymond G. Kammer, Jr., Chairman, Source Evaluation Board on Civil Space Remote Sensing Before the Subcommittee on Natural Resources, Agriculture, Research and Environment and the Subcommittee on Science and Technology, House of Representatives, June 21, 1983.

510 Statement of J. Robert Porter, Jr., President, Earth Satellite Corporation, Before the House Subcommittee on Natural Resources, Agriculture, Research ;and Environment and Space Science and Applications of the Committee on Science and Technology, June 28, 1983 (Commercialization of Landsat)

511 Overview of Civil Operational Earth Observing Satellites

512 Space Remote Sensing and the Private Sector: An Essay,National Academy of Public Administration, March 1983

513 Independent Public Accounting Firm's (Touche Ross) Financial Statement on the Landsat

514 Summary Listing of All Government Property Available for Sale with Each System or to be Used by A Successful Contractor in Performance of a Traditional Government Service Contract

VII.5. LANDSAT

This section of the RFP describes the current Landsat satellite system, the Government's needs and intentions after commercialization of Landsat and the requirements for proposals submitted in response to this RFP.

5.A. Description of Current System

There have been four Landsat satellites launched to date. Landsat 1, 2 and 3 have ceased to function. Landsat 4 was launched in July 1982 and has experienced several failures inlcuding a serious reduction in available solar array power and a complete loss of the X-band direct downlink for Thematic Mapper image data. As of September 1983, sufficient power was available to operate the MSS image data mission providing direct readout at S-band to U.S. and foreign ground stations and to provide one pass of Thematic Mapper data per day when TDRSS is operational. Hardware changes have been made to Landsat D' to correct the failure modes observed in Landsat 4. Landsat D' is in system test at the manufacturer's facility in preparation for launch.

5.A.1 Satellite

Landsat 4 and Landsat D' consist of NASA's standard Multimission Modular Spacecraft and a mission-unique instrument module. The satellite configuration is designed for a three-year mission life and can accommodate retrieval by the Space Shuttle in a near polar orbit.

5.A.1.a Bus

The spacecraft bus includes the attitude control, propulsion, communications, data handling and power subsystems.

5.A.1.b Sensors

The instrument module includes a Multispectral Scanner, a new Thematic Mapper sensor, a wideband communications subsystem, high-gain and other antennas, and a solar array capable of generating two kilowatts of power.

The Multispectral Scanner (MSS) has been the primary Earth-observing instrument on Landsat spacecraft. The MSS is a radiometer that collects and measures energy reflected or emitted in discrete intervals of the electromagnetic spectrum. It has four spectral bands in the visible and near-infrared portions of the spectrum. The picture elements of the MSS are 80 meters, when projected on the ground from the Landsat orbit.

The Thematic Mapper (TM) added to Landsat 4 and D' is a seven-band visible, near-infrared, and thermal-infrared multispectral, high-resolution scanner with 30-meter picture elements for all bands except the thermal infrared which has 120-meter elements. Like the MSS, the TM instrument collects, filters and detects radiation from the Earth in a swath 185 km (115 mi.) wide, then quantizes and multiplexes signals from its detectors into a serial data stream for transmission.

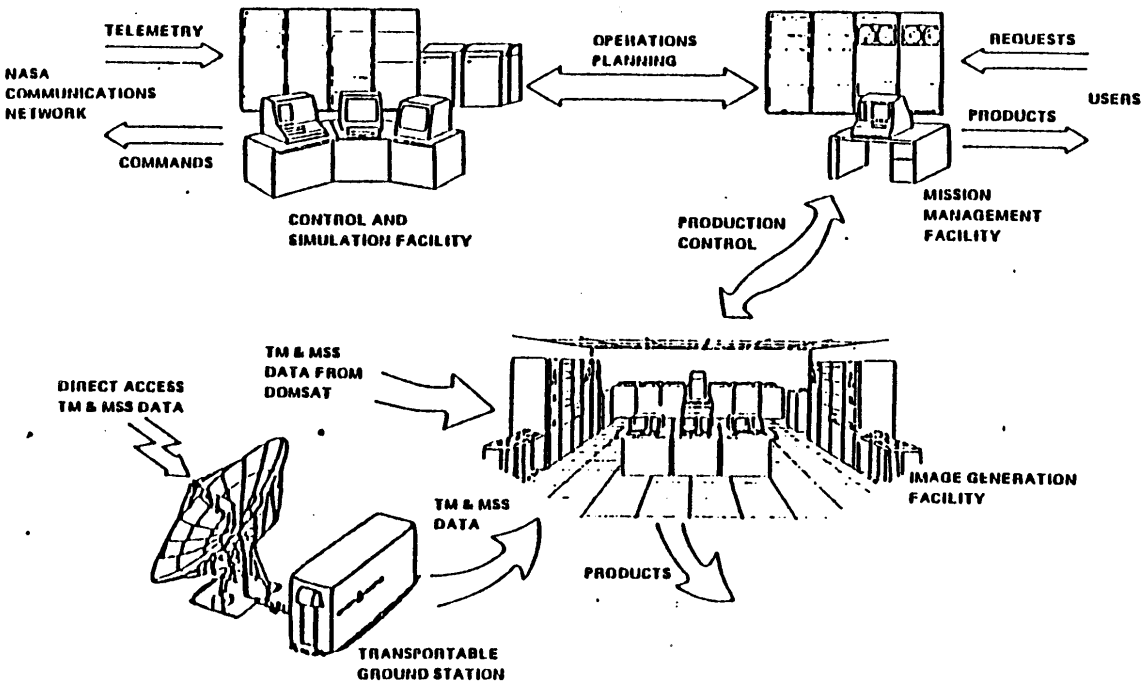

Figure 1 Landsat - 4/D' Ground Segment

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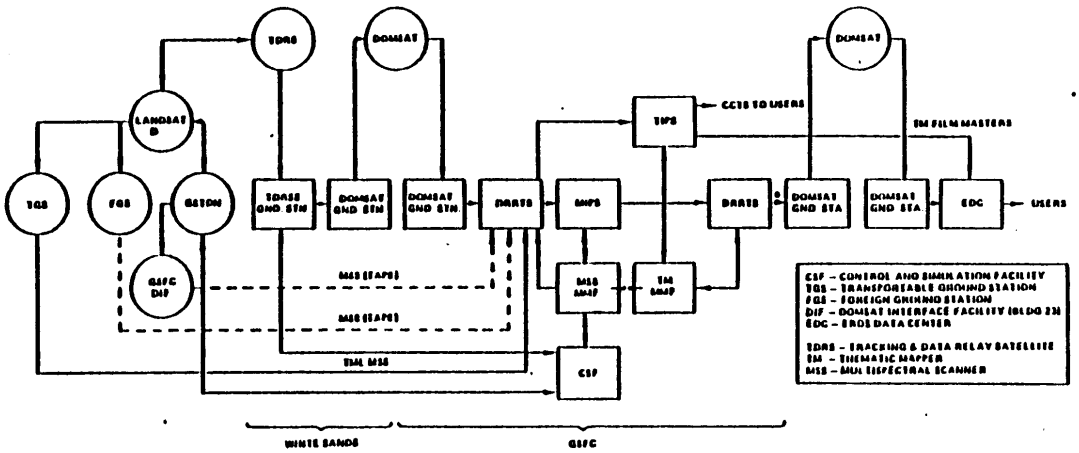

Figure 2 Landsat 4 "End-to-End" System

For purposes of this solicitation, the primary method for Landsat 4/D' image data reception will be through the TDRSS service to the terminal at White Sands, New Mexico.

Instrument data received via the direct readout TGS located at GSFC are utilized to evaluate the performance of the direct readout function of the Landsat 4/D' systems. This direct readout capability is intended for use by foreign ground station operators who are able to receive and process data directly from Landsat 4/D'. The dissemination of user data products to the public is from the U. S. EROS Data Center for U.S. and foreign coverage acquired by the U.S. data acquisition network and from the individual foreign data distribution centers for coverage acquired by their ground stations(s). In cases of duplicate coverage, the user has the flexibility to order data products from several data distribution centers.

Control and Simulation Facility (CSF)

The CSF is located in Building 28 at GSFC and has a dedicated control center with the capability to operate two Landsat 4 Flight Segments. As such, the CSF:

Coordinates the scheduling of ground resources for acquisition of image data, communicating with the Flight Segment, controlling and maintaining the Flight Segment;

Provides off-line mission planning and analysis;

Controls, monitors, and analyzes Flight Segment performance;

Coordinates and directs TM and MSS operations for the acquisition of image data and delivery of the image data to the Image Generation Facility.

The primary communications links between the Landsat 4 Flight Segment and Ground Segment are provided by the GSFC Networks Directorate using their NASA Communications (NASCOM) and Spaceflight Tracking and Data Network (STDN) (ground stations and TDRSS) systems. Additional communications links are provided by the TGS and by foreign countries through four Foreign Ground Stations (FGS). The Networks Directorate also performs orbit ephemeris definition and prediction based on STDN tracking. Equipment for experimental utilization of Global Positioning System (GPS) signals was flown on Landsat 4. The equipment is currently inactive although still functional. NOAA provides cloud cover predictions in support of CSF operations.

The CSF consists of six major subsystems:

1. Hardware Subsystem

The Hardware Subsystem consists of three Vax 11/780 computers, and their peripherals, a voice communications intercom, six control and display consoles, a switching unit, three NASCOM interface equipments, a simulator (CDHS) of the MMS communications and data handling module, and a quick-look monitor. This subsystem also includes the firmware for the

microprocessors in the various equipments and the VMS Version 2.1 Operating System Software for the Vax 11/780 computers. The functions of this subsystem are to provide the host and computational capabilities for the software subsystem, the man/machine interface for operation of the CSF and the Flight Segment, and the connections to NASCOM for access to the STDN communications with the Flight Segment.

2. Flight Scheduling Software Subsystem

The FSS receives user requests for MSS and TM data from the Mission Management facility and generates a time ordered list of Flight Segment and CSF activities which must be performed to acquire the data and to maintain the Flight Segment. The list of activities is provided to the Flight Operations Software Subsystem (FOS). After data acquisition has occurred, the FSS also defines to MMF those requests for image data which will not be satisfied and the reason the data request was rejected. In addition, FSS provides to FOS certain data which must be uplinked to the on-board computer.

3. Flight Operations Software Subsystem (FOS)

The FOS receives activity lists and On-Board Computer (OBC) data inputs from FSS. FOS then generates the time-ordered commands to accomplish the Flight Segment activities, merge the OBC data with those commands,and outputs the merged data to STDN for transmission to Flight Segment. FOS also establishes the CSF configuration, generates the time ordered list of TDRSS reconfiguration commands, and provides those commands to the Network Control Center Interface Software Subsystem (NCCIS). FOS also receives all Flight Segment (non-image) telemetry for storage, command verification and performance monitoring. FOS generates displays for the operators and accepts control inputs from the operators.

4. Performance Evaluation Software Subsystem (PES)

The PES receives telemetry data stored by FOS and analyzes the data to generate reports of performance of the flight segment and its subsystems.

5. Test and Simulation Software Subsystem (TSS)

The TSS Subsystem, together with the hardware simulator (CDHS), provides the capability to (a) simulate the flight segment for CSF testing and to (b) re-program the on-board computer. TSS runs on one VAX computer.

6. Network Control Center Interface Software Subsystem (NCCIS)

The NCCIS Subsystem provides the capability to communicate with the Network Control Center to request scheduling of STDN resources, receive schedules of STDN resources, reconfigure TDRSS and NASCOM supporting elements, and monitor the TDRSS performance at certain points in the system. NCCIS runs in a VAX computer with FOS.

Mission Management Facility (MMF)

The Mission Management Facility (MMF) consists of hardware, software, operations and procedures to provide User Request Processing, Image Data Production Management, Management Reporting, Data Base Management, Control Point Library Generation, Inventory Control, and Ground Segment Management. The MMF is sub-divided into two elements, MMF-MSS and MMF-TM, to maintain MSS and TM separability. Each element interfaces with the other to allow for the exchange of TM acquisition data. The MMF-TM has no direct interfaces that are external to the Ground Segment. Communication between MMF-TM and organizations/agencies external to the Ground Segment will be handled through MMF-MSS.

The MMF-MSS maintains the following external interfaces:

Project Office - accepts user acquisition/product request and mission guidelines and provides management reports to the Project Office.

NOAA - provide cloud cover assessment reports.

Photo/Shipping Support Facility - provide latent film, film shipping and process requests and receive processed film.

Shipping Facility - provide tape and tape shipping requests.

Each MMF consists of a Flight Management Subsystem (FMS), a Ground Management Subsystem (GMS), a Request Support Subsystem (RSS), and a Data Base Administration Subsystem (DAS).

1. Flight Management Subsystem (FMS)

The FMS manages requests for flight segment data acquisition. FMS responds to user requests for acquiring imagery and generates candidate acquisition requests. The status of each request is maintained as it progresses through further stages of acquisition processing to maintain traceability and accountability. Ancillary data accompanying imagery is formatted and organized on the data base by FMS in support of product generation functions. FMS communicates with Flight Scheduling in CSF over an intercomputer link supporting control and data file transfers.

2. Ground Management Subsystem (GMS)

The GMS is composed of the following functional areas:

Ancillary Data Processing - Ascertains parameters required for image processing schedules and tracking activities. These computations produce results which are required to support image processing activities.

Production Control - Serves as interface for all of the subsystems of the IGF in controlling and monitoring overall processing activities.

Product Tracking - Performs accounting and tracking of all IGF output products including CCT, HDT, and rolls of latent film.

Tape Generation - Generates Goddard HDT Inventory Tapes (GHIT) that are shipped (transmitted) along with corresponding HDT Image Data tapes to provide recipients with information concerning the contents of the HDT. This function also provides a CCT product tape copy capability.

Product Assessment - Supports the input of product quality data from interactive terminals and collects data quality information created by IGF processes. Data collected and analyzed include HDT bit error count, number of data/sync losses, geometric accuracy measures and sensor performance measures.

3. Request Support Subsystem (RSS)

The RSS is a single point of interface with organizations/agencies external to the Ground segment.

User Requests in the form of Standing Orders, Acquisition and Product Requests are processed by RSS and accepted or rejected based on guidelines and priorities. User data are tranferred to Data Base for later scheduling operations.

Additional RSS functions include: the maintenance of the Ground Segment Inventory system, including spare parts, consumables, tapes etc; tracking and processing Problem/Defect Reports (PDR) generated for Ground Segment equipment; software; facility; and operator problems.

4. Data Base Administration Subsystem (DAS)

The data base resident in the MMF is the repository of all of the information required by the Landsat-4 Ground Segment. Major sections of the data base are the main image file containing all of the information pertaining to successfully produced Landsat-4 image data, production area which stores data required for scheduling and tracking production through the Image Generation Facility, telemetry and ephemeris area where ancillary data required for image data processing is located and the GHIT area where data required for the production of Goddard HDT Inventory Tapes is located.

The DAS interfaces with the physical data base, maintains data base integrity, supports restructure of the data base, implements system programs to achieve proper system administration, and provides system utilities for use by application programs.

Image Generation Facility (IGF)

The IGF is responsible for receiving and processing the raw instrument data to produce film and digital products to the requisite performance requirements, for both MSS and TM data.

Absolute geodetic accuracy and temporal registration requirements are met to the extent that sufficient ground control points are available in the specific scene. Scenes with extensive cloud cover and uneven terrain may not meet the required specifications.

The IGF consists of a Data Receive, Record and Transmit Subsystem (DRRTS), and MSS Image Processing Subsystem (MIPS), a TM Image Processing Subsystem (TIPS), and a Payload Correction Processing Subsystem (PCS). As shown in Figure 2, there are distinct image processing subsystems for MSS and TM to provide complete separability of MSS and TM processing. The MMF provides process control for each image processing subsystem and the DRRTS as shown.

The MSS element of the IGF is used operationally. The TM element of the IGF is used, initially, in an adaptive R&D mode and will subsequently evolve into an operational system after the TM sensor and its performance are characterized.

1. Data Receive, Record and Transmit Subsystem (DRRTS)

The DRRTS accepts both the MSS and TM sensor data streams relayed from either Landsat 4 or D' by the TDRSS and the Domsat. The DRRTS accepts MSS or TM sensor data in real time directly from the transportable Ground Station (TGS). The DRRTS accepts High Density Tapes (HDTs) of MSS data recorded at either GSTDN sites and relayed via the Domsat or recorded at selected foreign ground stations and forwarded to GSFC for processing.

2. MSS Image Processing Subsystem (MIPS)

Major functions performed by the MIPS include:

MSS archival generation - the creation of partially processed HDT products;

MSS control point processing;

70 mm film generation for quality assessment;

MSS cloud cover assessment;

MSS performance evaluation product generation;

MSS product quality assessment.

3. TM Image Processing Subsystem (TIPS)

The TIPS accepts TM image data recorded on HDT by the DRRTS, processes the data into the required archival format similar to MSS processing, and subsequently into the required product format where the data is fully geometrically corrected.

Major functions performed by the TIPS include

TM archival generation - the creation of partially processed HDT products;

TM control point processing;

70 mm film generation for quality assessment;

TM cloud cover assessment

TM initial product generation - the creation of fully corrected HDT products;

TM final product generation - the creation of digital and 241 mm film products;

TM performance evaluation product generation;

TM product quality assessment.

4. Payload Correction Subsystem (PCS)

The PCS processes spacecraft attitude and ephemeris data, extracted from downlinked telemetry by the CSF, to create geometric correction functions that define corrections for systematic errors in the imagery. In addition, for TM data only, the PCS processes downlinked Angular Displacement Sensor (ADS) data to determine geometric correction functions that define corrections for the jitter measured by the ADS.

The PCS for MSS and TM are distinct and separate and are physically located within their respective mission management facilities.

Direct Reception Ground Stations

In addition to the transmission of Landsat-4/D' instrument data via TDRSS, the Flight Segment is capable of direct broadcast of instrument-image data to U.S. and foreign ground stations.

1. Transportable Ground Station

A Transportable Ground Station (TGS) was installed at GSFC for checkout of the Landsat-4 local user transmission system. During the initial activation of the on-board instruments, this station monitored the initial turn-ons in real time and subsequently monitored the X- and S-band systems performance. The TGS will transfer in real-time, acquired TM and MSS data to the IGF.

2. Foreign Ground Stations

The foreign stations give their users direct access to regional data for their regions. Figure 3 shows the Landsat-4 coverage from typical direct read-out stations.

Foreign ground stations have been a part of the Landsat program since its inception in 1972. Under agreements with NASA, they received Landsat image data directly when the spacecraft was in view of the station in exchange for an annual access fee. This decentralized

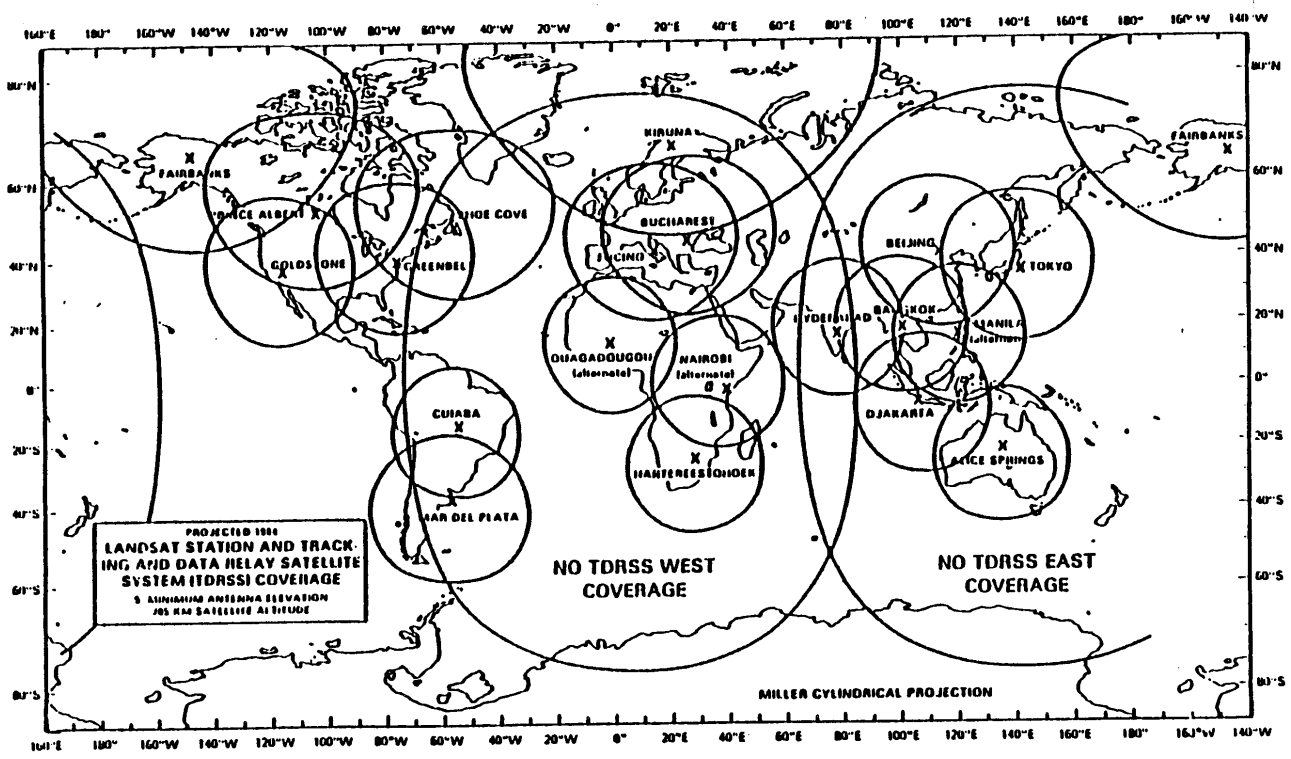

Figure 3 Typical Landsat Direct Readout Station Coverage

approach allows maximum user access to the system. NOAA provides direct readout services to foreign stations under new agreements under which the stations pay a yearly fee and royalties in exchange for use of the data.

These stations are purchased, maintained and operated at the cost of the foreign governments. Today there are foreign ground stations receiving, processing, and distributing Landsat data in Asia, Africa, Europe, South America, North America, and Australia. The stations are located in:

Mar del Plata, Argentina	Fucino, Italy
Alice Springs, Australia	Tokyo, Japan
Cuiaba, Brazil	Hartebeestohek, South Africa
Prince Albert, Canada	Kiruna, Sweden
Hyderabad, India	Bangkok, Thailand

Another station is being established in Djakarta, Indonesia. Also, NASA has concluded an agreement for a station in Beijing, China, although it has not yet been established. Other countries interested in establishing stations include: Romania, Upper Volta, Ecuador, Pakistan, Zaire, Saudi Arabia, Kenya and Iran

5.A.2.b.2) Ground Segment Facilities

The Landsat-4/D' Ground Segment operations and equipment resides in Building 28 at Goddard Space Flight Center. The Landsat-4/D' Ground Segment Operational System completely occupies wing A.

Bldg 28 wing A contains 26,675 net square ft. closely divided between two floors. The Image Generation Facility (IGF) occupies the first floor laid out as shown in Figure 4. The total 13,155 square foot floor space is allocated as follows:

6025 ft^2 IGF equipment

7130 ft^2 Office and support

The second floor of wing A is shared by the Mission Management Facility (MMF) and the Control and Simulation Facility (CSF) laid out as shown in Figure 5. The second floor space (13540 square ft) is allocated as follows:

4390 ft^2 MMF and CSF equipment

9150 ft^2 Office and support

The Transportable Ground Station (TGS) is located behind Building 7, adjacent to building 28.

5.A.2.c. Mission Operations and Support Activities

Several categories of mission support activities are currently employed by NOAA in the operation of the Landsat system. Certain communication and computational support activities are provided by NASA on a reimbursable basis.

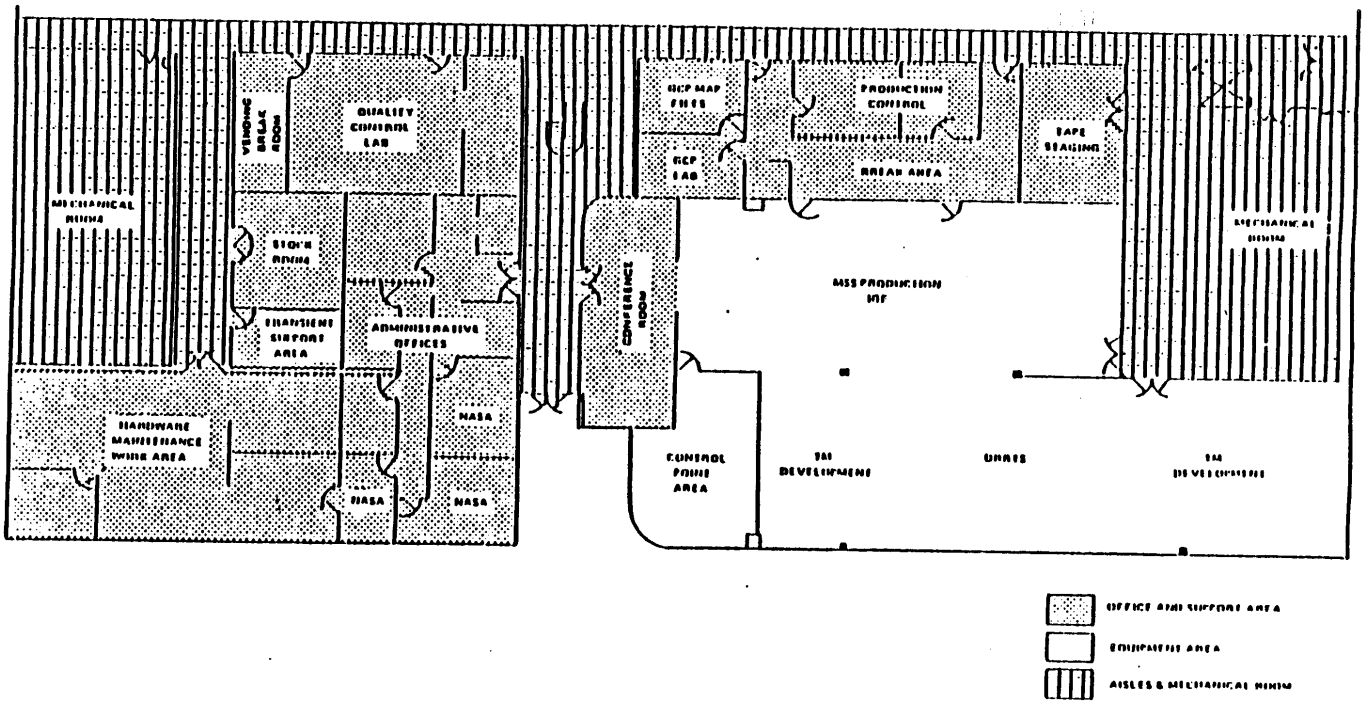

Figure 4 Landsat D/D' Ground Segment Facility, Building 28 (Wing A, First Floor)

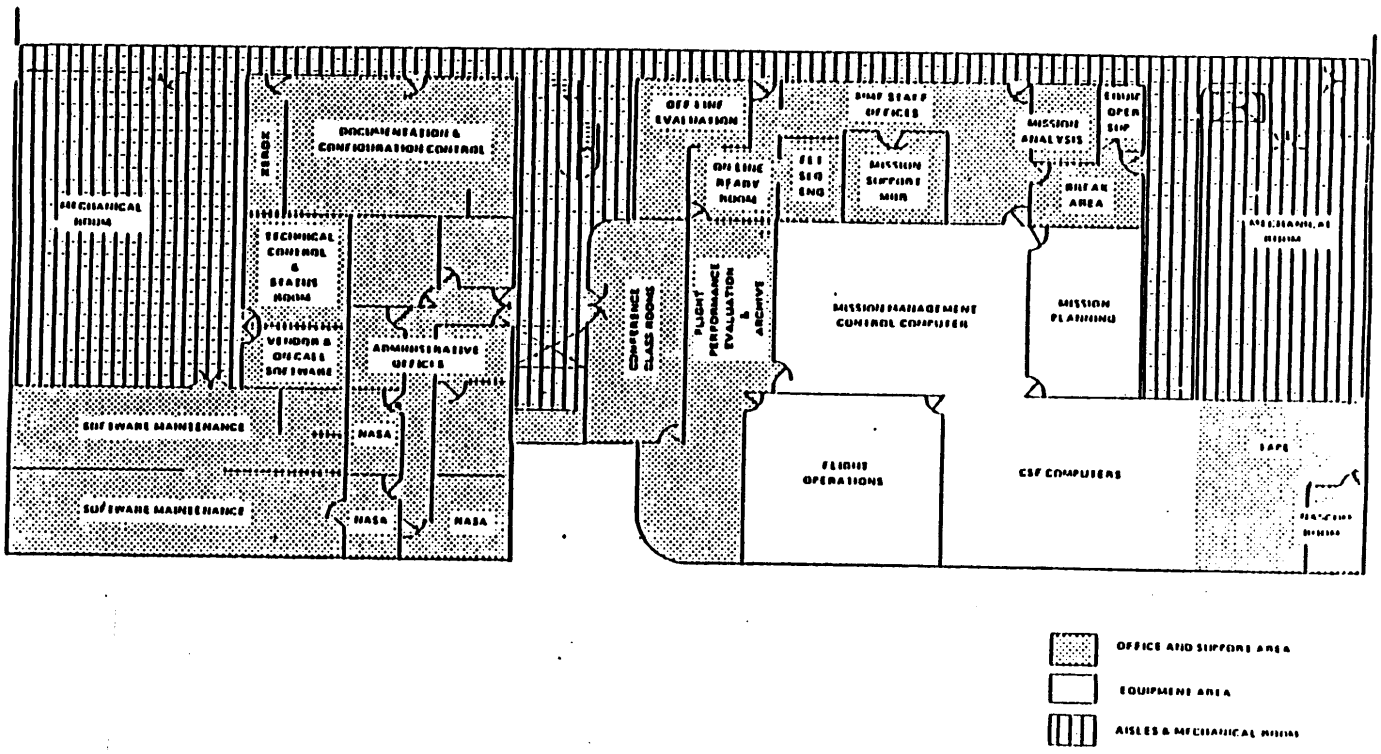

Figure 5 Landsat D/D' Ground Segment Facility, Building 28 (Wing A, Second Floor)

Other activities, primarily the Operation and Maintenance (O&M) of the ground seyment, are performed by NOAA contractors. The majority of the communications functions required in the future will be performed through TDRSS under announced policy for support of commercial satellite operations. Other communications and computational support, including that required for spacecraft emeryencies, etc., must be provided by the commercial owner/operator or separately negotiated with NASA, if required. The O&M contracts are periodically advertised and awarded and a suitable transition to a direct subcontract with the commercial owner/operator could be arranged.

5.A.2.c.1) Tracking and Data Network Support

Ground Spaceflight Tracking Data Network (GSTDN)

Network support of the Landsat-4 missions is provided principally by TDRSS. TDRSS provides support of S-band and Ku-band requirements for Flight Seyment commanding, telemetry housekeeping acquisition for Control and Simulation Facility activities and instrument image data collection for IGF processing. S-band support of command and telemetry is required typically twice per orbit. Ku-band image data collection is accomplished over all land masses and near land-water areas which are in sunlight and for selected nonsunlit land mass observations. The data volume received is in the range of 4 x 10" bits per day, seven days per week.

The GSTDN stations are utilized as necessary for Landsat-4 telemetry and comand function emeryency support in the event of TDRSS and/or Landsat-4 problems.

Tracking and Data Relay Satellite System (TDRSS)

Landsat 4 and D' are configured to use the TDRSS. While two narrow band telemetry tape recorders were incorporated in Landsat 4 and D' to cover delays in TDRSS implementation, wide-band video tape recorders for MSS and/or TM were not included. Therefore, worldwide video data cannot be received directly in the U.S. without the use of TDRSS or foreign ground stations.

For purposes of this solicitation, respondents should assume TDRSS-1 and TDRSS-2 are operational at 41° and 171° west longitude, respectively. At 705 km orbit altitude, Landsat-4/D' will not see the TDRSS over a region over the Indian Ocean north and south of the equator. This blind spot (called the TDRSS Zone of Exclusion) is shown yraphically in Figure 6. The Landsat-4/D' system is based on TDRSS inclination variation of ±1° about the equator. TDRSS-1 experienced an inclination larger than nominal. Current information is available from NASA.

The announced policy of the Government is that TDRSS will be fully available to commercial satellite operations. Procedural instructions and the current price schedule have been published in the Federal Register, "Tracking and Data Relay Satellite Systems (TDRSS); Use and Reimbursement Policy for Non-U.S. Government Users" (14 CFR Part 1215, Subpart 1). A new price schedule will be issued annually. Note that the listed priorities have commercial users several places from the top.

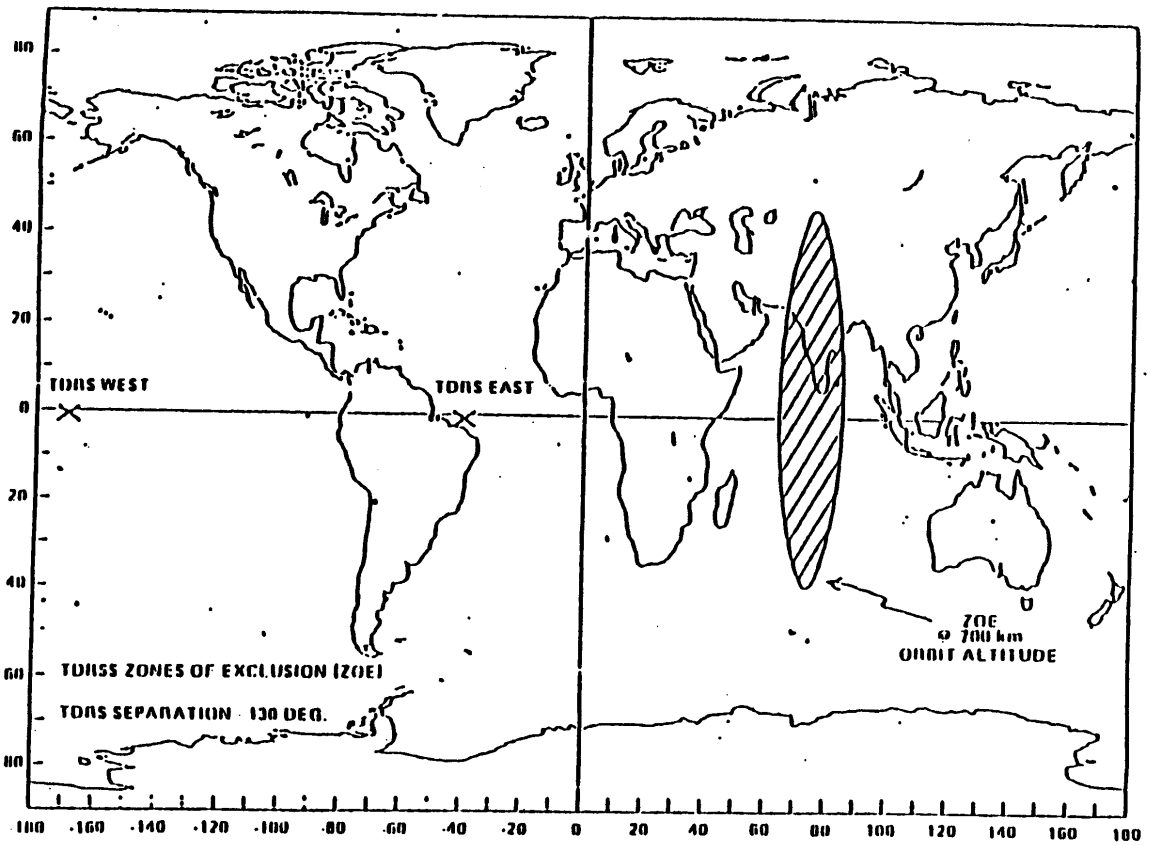

Figure 6 TDRSS Zones of Exclusion

5.A.2.c.2) NASCOM Support

NASCOM supplies the communication links between the GSTDN and Landsat-4 CSF and IGF. Basic communication requirements include voice, data, and command links to support real-time Landsat-4 operations plus wideband links from the TDRSS White Sands, New Mexico Earth Station to the IGF. Data are recorded at the White Sands TDRS stations and transmitted to GSFC via Domsat.

NASCOM arranges for and coordinates the Domsat service required for the relay of MSS image data from the IGF to EDC. NASCOM provides the intercomm for the CSF, IGF and TGS.

5.A.2.c.3) Ground Segment Operations and Maintenance (O&M)

The O&M of the CSF, MMF, IGF, and TGS is the direct responsiblity of NOAA. This responsibility includes the Landsat-4 mission operations as well as the production of data products and delivery to users, preparation of catalogs/work orders and the temporary maintenance of a raw data file.

5.A.2.c.4) Domsat Interface Facility Support

The GSFC Mission and Data Operations Directorate provides MSS sensor data acquisition and recording support via Domsat transmission to the Domsat Interface Facility (DIF) from GSTDN Stations prior to TDRSS availability and also in the event of TDRSS and/or Landsat-4 problems. This support includes the acquisition of Domsat transmissions and the recording of raw MSS sensor data on high-density tape. These high-density tapes are then transported to the Landsat-4 DRRTS for subsequent processing.

5.A.2.c.5) Tape Shipping Support

The GSFC Mission and Data Operations Directorate provides support required to package, label and ship product tapes, both high-density tapes and computer-compatible tapes, to users.

5.A.2.c.6) Digital Tape Unit Test Facility

The GSFC Mission and Data Operations Directorate, in their Digital Tape Unit Test Facility, supports the routine evaluation of Computer Compatible Tapes (CCTs) produced by the Landsat-4 Ground Segment to assess ground system magnetic tape unit performance.

5.A.2.d. Product Generation and Distribution

5.A.2.d.1) Introduction

The Department of Interior's Earth Resources Observation Systems (EROS) Data Center (EDC) in Sioux Falls, South Dakota processes and distributes Landsat data under reimbursable arrangements with NOAA. The Center provides access to Landsat data as well as to aerial photographs acquired by the U.S. Department of Interior, NASA and other Federal agencies. EDC's primary functions are data storage, reproduction and dissemination in response to user requests; user assistance and training; and research in techniques for manipulation of digital spatial data in cooperation with DOI and other agencies.

The Center's computer complex controls a data base of over 6 million satellite images and aerial photographs of the Earth's surface. The computerized data storage and retrieval system is based on a geographic system of latitude and longitude, supplemented by information about image quality, cloud cover, and data type.

5.A.2.d.2) Landsat Processing Facilities/Systems

All EDC Landsat and aircraft data processing, archiving, cataloging, and distribution activities utilize shared facilities, equipment, and staff that results in economies of scale. The major systems partially used or use-shared during Landsat data handling and processing are: EDIPS which processes MSS data from HDT to film and CCT's and is use-shared about equally with spatial data research and development activities; photographic laboratory equipment (11 processors and 35 printers) which are use-shared about 40 percent Landsat, 40 percent aircraft, and 20 percent spatial data research and development; and the Burroughs B6900 central computer system which has about the same utilization percentages as the photographic laboratory. The only equipment unique to Landsat data handling and processing are two processors and printers in the photographic laboratory and the high-density tape recorders and data formatting microprocessor boxes on the front end of EDIPS.

Performance of the Landsat data handling and processing functions requires extensive equipment maintenance and logistics support. Consistent and reliable preventative and remedial maintenance of both electronic computer and photographic processing equipment is provided to assure a system effectiveness level of 85 percent. Systems are maintained by a staff of electronic and mechanical maintenance technicians who are devoted to maintenance activities for high- and low-density tape recorders, EDIPS system components, laser beam film recorders, photographic printers and processors, and related support equipment. Logistics support is required to manage the large quantities of high- and low-density tapes, film and chemistry rawstock, accession aid materials, forms, etc.

5.A.2.d.3) Landsat Data Handling and Processing

Landsat data handling, processing, archiving, product generation and distribution at EDC began with the launch of Landsat 1 in July 1972. Until 1979, all Landsat data were converted to 70-mm black-and-white film, and selected scenes (based on user orders) were converted to CCTs at the GSFC and shipped to EDC for archiving, reproduction, and distribution. Beginning in January 1979, fully processed (radiometrically and geometrically corrected) high-density tape data were transmitted to EDC from GSFC via Domsat, and EDC created archive film for all the data and CCTs as required by users. Beginning in June 1981, partially processed (radiometrically corrected, but not geometrically corrected) high-density tape data were relayed to EDC, and EDC applied the geometric corrections and created archive film for all Landsat data and CCT's as required by users. This partially processed tape interface continues for Landsat 4 MSS data; however, the primary interface media for TM data are 241-mm black-and-white film and CCTs which are mailed from GSFC to EDC for archive, reproduction, and dissemination.

Current Landsat data handling and processing activities performed at EDC are as follows:

MSS Data Handling and Processing

MSS data (from 100 to 200 scenes/day) are received at EDC via Domsat and recorded on high-density tapes (HDTs) (about 25-30 scenes/HDT). Corresponding Goddard HDT Inventory Tape (GHIT) information that describes each of the incoming MSS scenes is received via landline and recorded on CCT's. The GHIT information is processed using the INquiry, ORder, and ACcounting (INORAC) processing system (EDC's major management information system) which resides on a Burroughs B6900 general-purpose computer system. The GHIT information updates the Main Image File (MIF) and schedules subsequent MSS image processing operations. The MIF is a computerized inventory of both Landsat and aircraft data archived at EDC.

Each scene of incoming MSS data is processed through the EROS Digital Image Processing System (EDIPS) which corrects geometry and generates high-resolution black-and-white 241-mm latent film of each band of data. EDIPS latent film is then processed in the photographic laboratory, chipped into working masters, and inspected for quality and cloud cover. The quality and cloud-cover information is used to update the MIF. The HDT's and film chips are archived and used as needed to generate user film and CCT products and accession aids.

TM Data Handling and Processing

Film and CCT TM data are shipped to EDC from GSFC. Each shipment of TM film contains a Goddard Film Inventory Tape (GFIT) which describes the TM film. The GFIT is processed into INORAC to update the MIF and schedule subsequent TM processing operations. The incoming film is verified and assessed for quality and cloud cover and then reproduced to generate a working master. The quality and cloud-cover information is used to update the MIF. The GSFC original film is archived and the reproduced working masters are chipped and used to generate user photographic products and accession aids. TM CCT's are verified on receipt; CCT's are reproduced and sent in response to customer orders. The original CCT is archived.

5.A.2.d.4) Product Generation and Distribution

Standard photographic products are produced by a high-throughput production photographic laboratory from archived working masters. Fully corrected photographic products are produced on film and paper, in positive and negative format, in black-and-white and color, and in sizes ranging from 70 mm to 40 inches. After products have been inspected, they are shipped to customers via either mail or parcel delivery services. CCT's are produced from HDT's or the CCT library upon customer order.

5.A.2.d.5) Landsat Archive at the EROS Data Center

At the end of July 1983, approximately 600,000 scenes of data acquired by Landsats 1, 2, 3, and 4 were archived at the EDC. Because of changes in data interface media between the NASA GSFC (where data preprocessing is done) and the EDC, Landsat data exist on different archive media as follows:

	Archive Media (Number of Scenes)					
	Total # of Unique Scenes	Computer-Compatible Tape (CCT)	High-Density Tape (HDT)	70-mm Film (Roll)	241-mm Film (Chip)	Color Composite Film (Chip)
Landsat 1	145,860	15,290	-------	145,870	-------	9,670
Landsat 2	185,105	6,820	46,500	143,700	40,840	7,740
Landsat 3	237,075	1,060	141,315	112,730	117,227	2,730
Landsat 4	16,600	-------	17,984	-------	16,414	46
Total	584,640	23,170	205,799	402,300	174,481	20,186

Approximately 5,000 square feet of floor space are required to store the digital data (10,000 HDT's and 7,500 CCT's) and film (42,000 rolls of 70-mm film and 520,000 241-mm film chips), which is environmentally controlled (temperature and humidity) to optimize storage conditions. With proper environmental conditions and handling procedures, HDT's and CCT's, and black-and-white film are expected to be good for 20 years and color film good for 10 years. In addition to the physical archive, reference information about each archived scene (including sensor type, scene ID, data acquired, area covered, cloud cover, quality, etc.) is maintained in a computerized data base (the INORAC MIF) which can be accessed by users through remote terminals. The MIF is updated when new data arrives at EDC. The MIF also reflects information about data holdings of participating foreign data receiving stations.

5.A.2.d.6) Customer Interface

Interface with Landsat data customers is accomplished through EDC User Services and a network of some 30 National Cartographic Information Center (NCIC) offices across the country. Major interface functions performed include: processing user requests for data acquisition, responding to inquiries about data availability; processing orders for data products; accounting and billing associated with data acquisition and user products; handling customer complaints, and maintaining inquiry forms, order forms, price lists, etc. Several Landsat accession aids are produced to help users determine data availability: Worldwide Reference System (WRS) maps that show the Landsat path and row intersections (nominal scene centers); microfiche catalogs of MSS and TM scenes available; and 16-mm microfilm (1 band black-and-white) of Landsat scenes available. The INORAC system plays a major role in supporting these customer interface funtions through the on-line terminals in User Services and the outlying offices.

Customers inquire about availability of remotely sensed data by defining a geographic point location or a rectangular area specified by latitude and longitude corner coordinates. After the geographic search is complete, the

computer prints out a listing of available images from which the requester can make a final selection. Receipt of a prepaid order initiates processing. Funds collected from the sale of Landsat data are used by NOAA to offset the costs incurred in operating the system.

EDC has approximately 340 employees (a combination of Government and contractor personnel) with about 60 man-years directly identifiable to data handling and processing. The majority of individuals staffing the data handling and distribution activities of the Center are shared between Landsat and aircraft data, with only 10-12 full-time individuals unique to Landsat operations.

5.A.2.e. Frequency Considerations

Frequencies Used In Landsat Satellite Operations

(Footnotes derived from Table of Frequency Allocations at 47 C.F.R.2.106.)

2106.4 MHz

Function:	Telecommand from Earth stations (Earth-to-Space) and from TDRSS (Space-to-Space).
Current Status:	Under footnote US90 Government and non-Government Earth-to-space and space-to-space transmissions in the space research and earth exploration satellite services may be authorized in the band 2025-2110 MHz subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to non-Government stations operating in accordance with the Table of Frequency Allocations.

2265.5 and 2287.5 MHz

Function:	Image Data and Telemetry to Earth stations (Space-to-Earth) (2265.5 and 2287.5 MHz) and to TDRSS (Space-to-Space) (2287.5 MHz only).
Current Status:	There are no allocation provisions for non-Government use of these frequencies.

8215.5 MHz

Function:	Image data (Space-to-Earth)
Current Status:	Under US258 the non-Government earth exploration-satellite service is allocated on a primary basis in the band 8025-8400 MHz. Such use is subject to case-by-case electromagnetic compatibility analysis.

13775.0 MHz

Function: Telecommand receive from TDRSS (Space-to-Space)

Current Status: Currently allocated to the space research service for both Government and non-Government use on a secondary basis.

15003.4 MHz

Function: Telemetry and Data relay to TDRSS (Space-to-Space)

Current Status: Currently allocated for Government use on a secondary basis. There is no allocation for non-Government use.

Procedures for Rulemaking and Licensing

The National Telecommunications and Information Agency (NTIA) in the Department of Commerce is responsible for managing Government use of the radio spectrum, including the present use by the satellite systems. The Federal Communications Commission (FCC), an independent regulatory agency, is responsible for managing private use of the spectrum.

The current Table of frequency allocations includes provision for the non Government use of the above listed Landsat frequencies except 2265.5, 2287.5, and 15003.4 MHz.

Conditional assignments of the 2265.5 and 2287.5 MHz frequencies would be handled through an exchange of correspondence between NTIA and the FCC, coordinated through the FAS as an exception to the Table without allocation action. Any licenses would include a requirement to schedule all opertions with GSFC, MD; Eastern Area Frequency Coordinator, Patrick AFB, FL; Western Area Frequency Coordinator, PT; Mugu, CA; and Satellite Control Facility, Sunnyvale, CA. Problems may result if new Earth station locations are selected by the non-Government user. This provison would be for the life of the satellite. The owner(s)/operator(s) should not expect an assignment in this band for follow-on satellites.

Some allocation action will have to be taken for the 15003.4 MHz frequency (telemetry and data relay to TDRSS). It is most likely that non-Government space stations will be permitted to use this band for transmissions to TDRSS on a secondary basis to Government stations operating in accordance with the allocation table. Such use would be subject to scheduling with NASA's GSFC and be subject to some power flux density limits.

The DOC will support a successful offeror's petition to the FCC to begin the necessary rulemaking to change appropriate service rules and provide assistance in obtaining required licenses.

5.B Government Needs and Intentions

5.B.1 Contractor Role

The Government intends that the Contractor will assume full responsibility for the operation and commercial development of the entire Landsat system within the constraints described in various sections of this Solicitation. Specifically, the Contractor must:

- Take over operation of the existing Landsat system and continue its operation until it fails or is replaced.
- Acquire and maintain Landsat data archives.
- Design, construct, launch, and operate future land remote sensing satellite systems.
- Develop, over the term of the contract to result from this Solicitation, a commercial market for remotely sensed data of sufficient size to make the overall effort commercially viable.

5.B.2 Government Role

The Government will:

- Oversee the operation of the system as required to ensure compliance with the constraints and requirements set forth in this Solicitation. (See for example, Section VII, Part 8 and Appendix A).
- Provide appropriate support in accordance with the contract, while the Contractor is developing the commercial markets necessary to ensure a self-sustaining operation.
- Purchase Landsat or equivalent data, as it requires to meet the need of various agencies.

5.B.3 Government Data Needs

Establishing firm estimates of the total number of Landsat images or CCT's that might be purchased has not been possible. The volumes of end products will depend on the resolutions, spectral bands, repeat observations, and data delivery and other characteristics of the commercial system. Some projections of Landsat data requirements can be made, however, and are listed below.

Department of Agriculture (USDA)

The USDA has a mix of needs for data over domestic and foreign areas. Foreign data requirements (i.e., global crop monitoring and prediction) are considered most important and require the greater volumes of data.

For USDA's domestic usage, applications for which Landsat data are considered useful are: crop inventory, yield estimation, and crop condition assessment; drainage models and watershed characterization; thermal anomalies; monitoring renewable resource conditions; water quality monitoring; and land use mapping

and monitoring. In meeting USDA's foreign mission requirements, satellite data are useful in: crop inventory, yield estimation, and crop condition assessment.

The most critical need of the USDA is data delivery for the crop-related programs. Receipt of data within two days after acquisition is desired. For all other requirements 7 to 30 days is adequate.

Crop-related programs require 5- to 7-day coverage of selected areas at critical times in crop calendar for both domestic and foreign programs. A few USDA programs require 18-day repeat coverage, and for others monthly to annual coverage is adequate.

Department of the Interior (DOI)

Landsat data are used by DOI for rangeland and natural vegetation inventory, wildlife habitat evaluation, ocean pollution monitoring, land use mapping, and geological and hydrological applications. DOI applications often involve merging Landsat-derived products (land-cover classifications, surface-water assessments, etc.) with other data (elevation, slope, aspect land ownership, mineral and water assessments, etc.). The resulting data bases are used for land management decision-making.

Stereoscopic data are desired for interpretation of landforms as an aid to geologic mapping and terrain interpretation. To meet the needs of topographic mapping which conform to precise National Map Accuracy Standards, higher precision and accuracy would be desired than has been achieved to date.

Although all DOI applications would be met by 12-hour data delivery, for most applications such turn-around is not essential. One- to two-week routine delivery would probably suffice for more than 75 percent of the needed scenes, and only a very small percentage would require less than two-day delivery.

Seven- to nine-day repeat coverage is desired, both for monitoring of episodal events, and to increase the probability of cloud-free coverage of desired areas within each season over that obtained from a 14- to 18-day repeat cycle.

U.S. Army Corps of Engineers Civil Works Programs

The Corps has indicated a number of needs for land remote sensing data to support the activities within its 38 districts. All data requested would be taken over the United States. Programs supported include damage assessment due to flooding and ice, wetland and estuary inventories, beach erosion control and shore damage assessment, snow pack parameters needed for flood control, studies of geologic structures in support of various activities, land use and cover classification for flood control projects and regulatory activities, environmental impact studies, navigation studies related to river and harbor projects, and the national Dam Safety Program.

For almost all the Corps' programs, Landsat data are characterized as useful but not essential because the data could be collected by other means. If Landsat data are available, however, they would be purchased and used. The

one program for which satellite data are considered essential is the National Dam Safety Program. The national scope of the program and the need for periodic repeat coverage make data collection by other means too expensive.

Stereo coverage at 10 to 20 meters vertical resolution is desired for studies of geologic structure. For other programs (damage assessment, flood control projects and regulatory projects) stereo would be useful if the vertical resolution were less than 10 meters. In general, the Corps requirements for stereo data can be met by techniques other than satellite remote sensing. If satellite data were available, the Corps would use it if it met program needs and were more economical than other techniques.

For damage assessment, regulatory studies, beach erosion and snow pack parameters, the Corps has specified 24- to 48-hour delivery of data as necessary. One week to one month delivery is specified for all other applications.

Department of Defense (DOD)

In general, the Landsat data needs of the DOD can be fully met in the context of the requirements of other Federal agencies listed above.

National Aeronautics and Space Administration (NASA)

NASA Landsat data needs, both domestic and foreign, would also be met in conjunction with the needs of other Federal agencies as listed above. NASA uses the Landsat system as a significant data source for the conduct of its Earth Science and Applications Research program. These data are integrated with data from advanced R&D technology sensors and form integrated inputs to physical and biological models aimed at acquiring an improved understanding of global processes. Data are required for each of the six major earth science programmatic areas: Land Processes; Atmospheric Dynamics and Radiation; Upper Atmosphere and Tropospheric Chemistry; Oceanic Processes; Geodynamics; and Global Biology. In addition to earth science research, the Landsat data provide an experimental baseline for the definition of requirements for advanced sensor systems. The commercialization efforts must take into account the international dimension of NASA's R&D requirements, in particular that foreign investigators are frequently selected to participate in NASA research programs, and they require access to data on the same terms as U.S. investigators. The international dimension is inherent in NASA's earth science research and is critically important in ensuring valid and globally relevant results.

Agency for International Development (AID)

AID supports many programs world-wide that have found use for Landsat data. These uses extend world wide and range from mineral and agriculture measurements to training programs.

5.C Proposal Requirements

5.C.1 Meeting Federal Data Needs

A proposal for the Landsat system shall address in this part the proposer's understanding of the data needs for Federal agencies and in particular:

- Means of providing the required global data for both mission responsibilities and research
- Procedures for tasking of data requirements and relationships to commercial market requirements
- Methods and procedures to improve data throughput and timeliness
- Pricing procedures and ordering schedules for data delivery
- System improvements to enhance data coverage, times and areas for Federal data needs
- Plans to interface with, and utilize the results of Federal agency programs in remote sensing R&D.

5.C.2 U.S. Government Oversight Authority

Successful operation of the Government-developed land observing system is a matter of great importance to the U.S. Accordingly, it is necessary that the U.S. Government have sufficient rights and authorities to ensure that the operating capabilities of this system are not compromised by error or inadvertance. Any proposal submitted in response to this RFP must address this issue in depth, including U.S. Government oversight of Contractor operations, U.S. Government authorities to prevent or correct deficiencies either technical or financial that would threaten the operational capability of the system, and procedures to ensure the prompt and effective implementation of these authorities.

5.C.3 Landsat Data Archives

Proposals addressing takeover of the existing Landsat data archives must indicate an understanding that many of the Landsat data have been made available to Government agencies and to the public, and hence are already in the public domain. The Government requires that Offerors include provisions to offer return of the archives to the Government if they are found to be of no value to the Offeror. Proposals must address arrangements for maintaining archives of Landsat data which will be collected by the offeror, including offer of the archived data to the Government, at no cost, prior to purging or destruction. In addition, the proposal shall address any proposed restrictions on Government dissemination of such data.

5.C.4 EROS Data Center

Proposals shall consider the EROS Data Center Landsat data handling and processing functions described above as part of the contractor-operated Landsat system in any subsequent contract. Offerors should not propose the

transfer of NASA White Sands facilities and equipment or DOI EDC facilities and equipment, as these will continue to be needed by NASA and DOI for support of ongoing programs.

The proposal shall:

- Demonstrate an understanding of the functions and purpose of the EROS Data Center and its operations;
- Specify the proposed operating plans and procedures at time of contract award to indicate the method of utilizing this shared facility; the proposed role of the government; any proposed contractual arrangements, staffing and maintenance. Particular attention should be given to the requirements for phase-in as outlined in Section VII.7.
- Demonstrate a viable plan for the development, operation and use of a contractor-dedicated facility for these functions at the earliest possible date, indicating as a minimum, the location, equipment acquisition, data communications, staffing and system improvements for current and future Landsat spacecraft and sensors. Of interest will be the ability of such a system to fully accomplish the government requirements.

5.C.5 TDRSS

A proposal shall also address in this part the understanding of the use of and procedural requirements for the TDRSS. For any proposed follow-on Landsat system beyond D', the offerorr has the option of designing the system so it does not use TDRSS. Any such option must show as a minimum the advantages and disadvantages of such a design with attention to data coverage, effects on foreign and domestic markets, system reliability and lifetimes, cost comparisons between the selected communication system and TDRSS usage and the effect on government Landsat data needs. (See Section VII.7).

5.C.6 Operations

In addition, a proposal for the Landsat Satellite System shall address in this part the proposer's understanding of the current Landsat ground system operation with particular attention to:

- Plans, procedures and proposed contractual arrangements to manage, operate and control the current ground system facilities. Of equal concern are the planned schedules, staffing and any proposed sub-contracting arrangements. (See Section VII.7).
- Plans, required developments, schedules, location and staffing to establish and operate a wholly owned and housed contractor facility, if any for the current Landsat 4, and D' and/or any proposed Landsat satellite system to follow Landsat D'.
- Procedures and arrangements for ground and space communications for ground segment support and data flow.

5.C.7 GPS

As defined above, an experimental GPS system was flown on Landsat - 4. The contractual requirements will only cover operation and maintenance of the associated ground equipment necessary for continuation through Landsat D' until system failure. No USG requirement has been stated for the GPS on any LRS beyond Landsat D'. Planned system use, if any, of the GPS in an operational mode should be described together with the advantages and disadvantages of using GPS in lieu of ground-based or TDRSS tracking data.

5.C.8 Research and Development

The proposal shall address the understanding of the needs and purpose of remote sensing data for R&D and the approach to provision of operational data for research. Explicit reference should be made to:

- o Provision of both operational and experimental data in support of R&D activities as described above;
- o U.S. Government use of remote sensing data from foreign satellites for R&D purposes;
- o The methods proposed to maintain cognizance of R&D results for purposes of system or product improvements for commercial use; and
- o Interface with Federal agencies having primary responsibility for aerospace R&D, including R&D related to applications of aerospace remotely sensed data.

5.C.9 Frequency Management

A proposal for the Landsat satellite system shall address the offeror's requirements, plans and procedures for obtaining access to and utilizing the frequency spectrum. As a minimum, the proposal shall provide the offerors' understanding of the issues involved, the approach, and the management organization to be utilized to assure effective coordination of frequency spectrum utilization. The proposal shall separately address these issues with regard to satellites/systems furnished by the Government and those designed and constructed by the private sector owner/operator.

5.C.10 Launch System Planning

A proposal for the Landsat system shall address the plans and procedures, with associated cost and schedules, for launching proposed future land remote sensing satellite systems. The Government currently plans to discontinue Delta launches from WTR after the launch of Landsat D'. Under this contract, the Government shall not be obligated to provide peripheral support or services in the form of boosters (ELV or STS), launch pad support, tracking aircraft support, command and control support, test range support, or other specialized support, to the commercial operator. However, Government support may be provided on a cost reimbursement or other basis.

VII.6. SYSTEM IMPROVEMENTS

Background

For the Landsat system, both the spacecraft and the associated ground systems represent proven but relatively old technology that will require eventual replacement in any subsequent contract resulting from this solicitation. A listing of the present and planned hardware systems, both spaceborne and ground and their nominal life-times is given in Table 1. R&D relevant to satellite operations might range from basic science and data utilization in various clients's areas of interest through launch, data handling and spacecraft technology to advancing the state of art in observational sensors. A proposal shall address in this part the elements of R&D outlined below.

6.1 Contractor Role

An offeror/operator will be responsible for the design and fabrication of new generations of spacecraft, improvements in operational efficiencies of the system, especially the inclusion of new technology for the spacecraft and data handling systems and the development of new product formats to satisfy market demands. Each of these requires R&D in aid of market development, in updating the system to respond to advances in the state of the art and in improving the operating characteristics of the system so as to (a) reduce the cost to the government, and (b) stimulate wider commercial use.

Inherent in the process above is the need for in-house R&D and full awareness of other R&D in the area of advanced sensor and spacecraft technology. In the past, sensor technology improvements for the Landsat systems has been a joint venture of NASA, NOAA, and DOD. This process has worked well wherein NASA has taken the lead in sensor measurement techniques and data analysis while NOAA, NASA, and DOD have developed assimilation techniques to demonstrate the data utility to their respective missions.

6.2 Government Role

The Presidential Decision memorandum that led to the commercialization aspects of this RFP states that R&D by NASA, DOD, and other Federal agencies on civil space remote sensing will continue. Of particular importance to the Government is the offeror's approach to R&D including the understanding of the need for and use of operational remote sensing data in the R&D process. It is the U.S. Government's strong belief that an aggressive, continuing Federal R&D effort in advanced remote sensing technology is critical to maintaining a U.S. leadership position in civil space technology, as well as to advancing the understanding of changes to global earth processes and their long-term impacts. In that regard, it is important that the offeror specify plans to coordinate with and take full advantage of the continuing R&D programs of NASA, NOAA, DOD, and other Federal agencies involved in remote sensing research.

In particular, the Government develops and flies new sensors and instruments because the data to be collected are needed for the conduct of Government-supported programs, including programs jointly supported by the U.S. Government and private entities or foreign governments. If the data are to be

used with confidence, the instruments that produce them must be well understood, calibrated and qualified. Test flights are required for which several methods are available: Shuttle payloads, aboard NASA free-flyers or joint NASA/other Government free-flyers, or as part of the instrument complement of operational satellites. This last mode has been used among NASA, NOAA, and DOD. Similar options should exist for flights aboard commercial spacecraft. The final choice will be made by the appropriate U.S. Government agency(ies) based on what arrangement is most advantageous to the Government R&D program.

The TM instrument on Landsat is presently considered experimental but should be considered operational for purposes of this solicitation.

NASA has other Earth-sensing instruments currently under development, each of which may have further roles in a commercial system. A listing of these sensors is given in Table 2.

Table 1

ANTICIPATED USEFUL LIFE
REMOTE SENSING SATELLITES and GROUND STATIONS

LANDSAT

SATELLITES		GROUND SYSTEMS
Landsat-4	1982-1984	
Landsat-D'	1984-1987	1982-1992

Table 2

EARTH SCIENCE AND APPLICATIONS

LAND OBSERVING INSTRUMENT DEVELOPMENT

INSTRUMENT	OBJECTIVE	SENSOR DESCRIPTION	STATUS
Large Format Camera	High Resolution Mapping Camera	30.5 cm Focal Length	STS-14 Launch in June 1984 STS-17 Launch in August 1984
Shuttle Imaging Radar (SIR-B/C)	Fundmental Research In Microwave Remote Sensing	L-Band SAR Tilt and Fold Antenna Digital Data Controllable Incidence Angle	STS-17 Launch in August 1984
STS Multi-spectral Linear Array	Biomass, Bi-directional Reflectance, and Atmos-pheric Effects	Off-Nadir Pointing 10-60M Resolution 6 Band (4 Visible, 2 Shortwave Infrared) Focal Plane Sensor	Shuttle Payload in CY 1987
Shuttle Imaging Spectrometer (SIS)	Improved Spectral Discrimination of Geology, Vegetation and Soils	Hi Spectral/Spatial Resolution Spectro-meter (.4-2.5/UM)	Shuttle Payload in CY 1989

6.4 Oceanography ??

6.5. Government Use of Data for R&D Purposes

The ability to engage in global research has been fostered by the U.S. policy of providing non-discriminatory access to remote sensing data -- both within the U.S. and internationally. R&D programs have not been subject to geographical limitations. U.S. scientists have thus enjoyed unrestricted access to worldwide data of prime scientific interest in reaching an understanding of global phenomena. Efforts to maintain non-discriminatory data access have been supported by the Government in the deliberations of the United Nations Outer Space Committee.

The U.S. Government conducts a wide variety of space-based experiments to evaluate remote sensing techniques for basic and applied studies of the Earth. Experimental sensors placed on orbiting spacecraft can be used to collect remote sensing data in many different parts of the world. Wide dissemination of this data within the global research community is essential to evaluate fully its utility. Past experience with has demonstrated the desirability of involving foreign participants in U.S. Government research programs, in part in order to obtain necessary ground truth measurements. Similarly, a broad spectrum of U.S. investigators participate in these research programs. Limitations on the availability of such data would restrict the scope and extent of research, which, in turn, would reduce the Government's overall return on its investment in specific orbital experiments.

As indicated above, the U.S. Government achieves a significant "multiple effect" on the return on its research investment by permitting experimental data to be widely disseminated. Restrictions on the flow of data into the research community would reduce or diminish the overall R&D achievements of specific flight projects. The flow of such data into the worldwide research community plays an important role in expanding current awareness of the utility of space techniques.

A. R&D Requirement for Foreign Remote Sensing Data

A number of foreign nations/agencies (France, Japan, European Space Agency, Canada, India, Federal Republic of Germany, Brazil) are currently developing or plan to develop remote sensing missions. Research scientists have already made plans to obtain data from the German-developed Modular Optoelectronic Multispectral Scanner (MOMS) instrument scheduled for a June 1983 Shuttle experimental flight and the Microwave Remote Sensing Experiment (MRSE) instrument scheduled for flight on Spacelab 1 in September 1983. We anticipate future research requirements for access to European Space Agency ERS-1 data (in particular ERS-1 SAR data) in the 1988 timeframe, Japanese MOS-1 data in the 1986 timeframe, and Canadian RADARSAT data in the the early 1990s. Although we have not yet identified specific research requirements for French SPOT data, it is likely that U.S. scientists will have access to this data in the same manner as will other U.S. users -- through purchase of the data. In the other above-cited instances, it is likely that we will obtain foreign satellite data for experimental purposes through cooperative agreement in exchange for U.S. data, in support of U.S. investigators, or in return for U.S. ground truth support.

The U.S. is exploring the possibility of direct readout of foreign remote sensing satellite data by U.S. ground stations for experiment purposes. Such

arrangements could be patterned after similar arrangements whereby U.S. experimental satellite data have been acquired by direct readout at foreign ground stations on the basis of negotiated agreements.

B. Foreign Participation in U.S. R&D Programs

R&D efforts benefit from the participation of foreign scientists and investigators. A number of foreign scientists and counterpart foreign agency personnel have demonstrated expertise in the area of earth sciences. Their own research often complements that of their U.S. peers. In the earth sciences area, foreign scientists/investigators have participated and continue to participate in the Landsat-1, -2 and -4 investigations, Shuttle Imaging Radar-A and -B investigations, and are associated with the Skylab, Nimbus-7, Magsat and Heat Capacity Mapping missions. Foreign involvement is desirable in virtually all of the future U.S. remote sensing programs. In particular, foreign ground truth support and participation by foreign investigators will be crucial in the development of an integrated NASA Global Habitability program.

Foreign scientists and foreign counterpart agencies have command of resources which are often of value in the context of cooperative programs. Cooperation is anticipated in the joint flight of NASA's Shuttle Imaging Radar-C with the German Remote Sensing Experiment (initially flown on Spacelab 1) in the 1986 timeframe. Another example is the back-up tape recorder support at foreign Landsat ground receiving stations (operated at foreign agency expense) enabling satisfaction of U.S. Government data requirements not otherwise attainable in the pre-TDRSS era.

As foreign counterpart agencies develop their own earth science missions, we can expect reciprocity in receiving access to foreign-acquired data and participation by U.S. scientists and investigators on foreign mission science teams.

C. International Considerations

Like domestic investigators, foreign investigators associated with R&D efforts receive the data they need at no cost. In addition to bringing demonstrated expertise to the investigation and engaging in activities of specific interest, foreign investigators can provide valuable ground truth support and other resources of great potential value to the R&D program. See Section VII.8 for a discussion of the Government requirements with regard to international research data applications.

1. Provision of both operational and experimental data in support of the R&D activities described above;

2. U.S. Government use of foreign data for R&D purposes; and

3. The methods proposed to maintain cognizance of R&D results for purposes of system or product improvements for commercial use.

4. Arrangements/approaches designed to lessen the impact of increasing data prices on the Government's capability to conduct a viable R&D mission in remote sensing and to maintain the present U.S. leadership in the face of foreign competition.

5. Plans to coordinate with Federal agencies having primary responsibility for aerospace R&D, including R&D related to applications of aerospace remotely sensed data.

VII.7 COMMERCIALIZATION PLAN

The description of and requirements for a commercialization plan are now contained in Section VIII of this RFP. All references to Chapter VII.7 should be understood to refer to Section VIII.

VII.8. FOREIGN POLICY AND INTERNATIONAL COMMITMENTS REQUIREMENTS

This part sets forth the obligations of any private owner(s)/operator(s) of the land remote sensing satellite ("Landsats"), within the context of U.S. international requirements and foreign policy objectives and considerations. It defines the areas wherein the Department of State and other responsible Federal agencies must play a key oversight role. The institutional mechanisms for U.S. Government oversight of private owner(s)/operator(s) are set forth in Section III. In order to assure clear presentation of the obligations which private owner(s)/operator(s) are expected to assume with respect to their international activities, those of the Landsats are set forth below.

8.1 Background

(a) Current U.S. Government Landsat practices and policies

Providing non discriminatory access to remote sensing data has also been a central feature of the U.S. Government's policies on the Landsat program, which has been operating for more than a decade. At the time of the launch of ERTS 1, concerns were raised internationally about the potential of countries with land remote sensing capabilities to derive and exploit exclusive information concerning the natural resources of lesser developed countries. These concerns led to discussions in the United Nations and other organizations of mechanisms which might be used to restrict certain aspects of remote sensing from space. In response, the United States took the following steps which muted international efforts to restrain land remote sensing from space:

- Declared that Landsat data were available to anyone who wished to use them. To implement this declaration, a central depository for all U.S. processed data was established at the EROS Data Center and data were sold to any person or nation without discrimination as to timeliness or price.

- Promoted and encouraged other nations to build and operate their own facilities to receive and process Landsat data, and agreed to turn on the transmitter, (subject to technical limitations) whenever the satellite was within range of such foreign ground stations in exchange for a yearly access fee.

- Further encouraged regional distribution of Landsat data by making it a condition of the agreement to turn on the satellite's transmitter over a foreign ground station that these stations would also distribute processed data to other nations without restriction.

- Encouraged participation of fureign nationals in U.S. research programs and, in come cases, funded research by foreign nationals and provided financial support for operational applications demonstrations. Scientists and technicians from developing nations were trained to understand the use of Landsat data and to support research or economic/social objectives of each interested nation.

- Set fees to purchase Landsat data from the EROS Data Center at the

cost of reproduction. This had the effect of not preventing poorer nations from purchasing and using Landsat data.

The Soviet Union has also operated land observing satellite systems, but does not maintain a policy of making all data available on a non-discriminatory basis. France plans to launch SPOT, a sophisticated multispectral land remote sensing system, in 1985. Japan expects to launch an advanced land remote sensing satellite sometime between 1988-1990. France has declared that it will make its data available on a non discriminatory basis to the international user community. At present, we have no firm information how the French will define "non-discriminatory" data availability. The price to be charged for SPOT data and the details of the agreements between SPOT Image (the commercial outlet for SPOT data) and the owners of the foreign ground stations (in most cases the same ones who receive Landsat data) may dictate that these policies be implemented differently. Other countries are considering plans to launch their own land remote sensing satellite systems, but these systems are still in the early planning stages.

The current state of international thinking on land remote sensing, at least on the governmental level, is perhaps best reflected in the report of the 1982 Unispace Conference. That report noted that although remote sensing is still in a "pre-operational" stage, "it is only a matter of time--and a short time--before this very important application attains a completely operational status." Given this reality, the report said "agreement should be reached on principles governing satellite remote sensing. Work to this effect . . . should be continued as a matter of priority, aimed at speedy agreement on such principles." In addition to a framework of general principles, concern was expressed that . . .

> "Satellite operators should give assurance about continuity of data flows and provide indications about estimated lifetime of pre-operational and operational systems in order to help all countries, in particular the developing countries. Compatibility of various systems and data formats is another important aspect . . ."

At the Unispace Conference in Vienna in August, 1982, some delegations persisted in expressing serious concern regarding the dissemination of data collected by remote sensing satellites. Several developed (including the U.S.) and developing countries stated that such information should be freely available for fair-cost purchase by any interested party. Many delegations asserted that the consent of the sensed State must be obtained before remote sensing, even if the information was not to be disseminated beyond the concerned States. Other delegations felt that in no case should the information be available to any State other than the sensor and sensed States. Most representatives expressing an opinion on the point agreed that priority in access to data must be accorded the sensed State. The United States has categorically rejected any international restrictions on remote sensing. (C.f. United Nations, Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, August 9-21, 1982; A/CONF.101/10.)

(c) International Obligations

(1) International Agreements

Current United States policies and practices regarding the Landsat systems and programs are embodied in a number of international obligations and multilateral agreements. Principal among these are:

- The 1967 Outer Space Treaty. Which stipulates, inter alia, that member States shall be responsible for all activities in outer space of their nationals, whether Government agencies or non-governmental entities;

- o The 1973 Convention on International Liability for Damage Caused by Space Objects. Which makes member Governments fully liable for damage caused by space objects under their registration, whether such objects are launched/operated by Government agencies or non-governmental entities;

- o The 1976 Convention on Registration of Objects Launched into Outer Space. Which holds member States responsible for notifying appropriate international authorities of all objects launched into space by their nationals, whether Government agencies or non-governmental entities, and holds member States responsible for seeing that such objects are properly registered with appropriate international authorities;

Search & Rescue ?

(2) Memoranda of Understanding with Foreign Landsat Ground Receiving Stations Operators.

Since 1972 the U.S. has concluded memoranda of understanding (MOU's) with several foreign ground station operators to permit those operators to directly receive data from Landsat satellites for a fixed annual fee (currently $600,000 per year). Under the provisions of the MOU's, foreign Landsat ground stations must disseminate data to reguesters on the same open, non-discriminatory basis as does the U.S. Government. Each MOU provides for termination upon cessation of U.S. Government operation of the Landsat system (see Section 8.4(e) page VII.8-14 below).

8.2 General

(a) Obligations

(1) Private owner(s)/operator(s) shall be (a) United States firm(s) as set forth in Sections III and V above;

(2) Private owner(s)/operator(s) shall obtain the prior approval/concurrence of the U.S. Government on matters involving:

(A) overall U.S. space policies, and international treaty obligations;

(B) relations of the private owner(s)/operator(s) with foreign governments, agencies, or international bodies;

(C) other matters specifically identified in this section VII.8

(3) Private owner(s)/operator(s) shall provide 30 day advance notification of negotiations with foreign governments, agencies or international bodies so that the U.S. Government may advise him (them) of relevant foreign policy concerns and/or provide such assistance as it deems appropriate.

(b) Procedures

All notifications and requests for approval/concurrence, concerning matters governed by this Section VII.8 shall be directed to the Government's Contracting Officer identified in Section V. Government decisions shall be made through the mechanism set forth in Section III.

(c) Proposal Requirements

To ensure that the proposer understands the issues involved, each proposal shall include, in addition to the matters required elsewhere in this Section, the plans and procedures to address the foreign policy issues and international obligations mentioned herein, as well as when and how the proposer will provide the required notifications or requests for approval/disapproval.

8.3 Landsat System

(a) Satellites

(1) Obligations

(A) A private operator of the U.S. civil land remote sensing satellite(s) shall operate the satellite(s) as determined by any resultant contract from this RFP. However, such owner/operator shall act under constraints set forth by the international obligations entered into by the U.S. Government, enumerated in Section 8.1(c)(1)above. To implement existing international obligations which include the UN Outer Space Treaty of 1967 and related Conventions on liability and on registration, the U.S. Government must have adequate authority and opportunity for supervision of:

(i) the compliance by private owner(s)/operator(s) of space programs/systems with overall U.S. space policies and international treaty obligations;

(ii) the relations of the private owner(s)/operator(s) with foreign governments, agencies, and international bodies.

(B) In addition, a private operator/owner of land satellites shall provide the U.S. Government with information regarding intended relations with the French, Japanese, and the European Space Agency. At present the U.S., France, and Japan cooperate in land remote sensing through the Coordination on Land Observing Satellites (CLOS). The purpose of the CLOS is to maximize technical parameters of current and planned land satellite programs. Should the land satellites be commercialized, the U.S. Government will continue its active international research and development coordination role within the CLOS structure. Opportunity will be afforded the private operator to coordinate with responsible U.S. Government agencies as necessary and appropriate.

(2) Procedures

(A) The U.S. Government shall review and approve/disapprove decisions of private owner(s)/operator(s) on relevant matters and issues involving international obligations described in Section 8.1(c)(1).

(B) Relations developed between a U.S. private owner/ operator of land satellites and current or future foreign land satellite operators shall be subject to appropriate supervision/oversight by the U.S. Government.

(3) Proposal Requirements

A proposal for the Landsat satellites shall provide, as a minimum, evidence of the proposer's understanding of the issues involved pertaining to internatinal obligatins, and stipulate approach and organization for interface with foreign entities, the U.S. Government, and other satellite operators.

(b) Sensors

The U.S. Government must be notified if the operator plans to include any foreign origin sensors on future Landsats.

(1) Obligations

In order to encourage and promote private commercial operation of the Landsat system programs, the U.S. Government is willing to grant (the) potential private owner(s)/operator(s)/vendor(s) the following:

(A) Exclusive ownership of all data produced by the Landsats under his (their) management; acknowledging the copyrightable character of this data and the right of (the) owner(s)/operator(s) to protect his (their) copyright interests; and

(B) Subject to the obligations set forth in (e)(1), below, exclusive right to distribute data internationally from Landsats under his (their) management, including the right to enter into data/pricing/finance systems contracts of his (their) own determination with any foreign ground stations operators (this shall include the right to negotiate with foreign Landsat ground station operators limits of liability, definitions of terms under which contracts shall cease, procedures for the settlement of disputes, and other miscellaneous provisions).

The private owner(s)/operator(s)/vendor(s):

(A) Shall conform their programs as closely as is commercially possible to traditional U.S. Government practices of providing civil land remote sensing satellite data to all users on an open, equal, non-discriminatory basis.

(B) Shall consult with and obtain the approval of the U.S. Government, before instituting major changes in international data processing and distribution practices, to ensure that such changes are in conformity with the international obligations and foreign policy objectives of the U.S.

(2) Proposal Requirements

The private owner(s)/operator(s) should address plans and policies for international data sale and distribution.

(d) International Research/Humanitarian Data Applications

(1) Obligations

Numerous Federal agencies including NOAA, USGS, and especially AID have employed Landsat data extensively and successfully over the past decade in a variety of worldwide space technology assistance programs. Such assistance programs include, but are not confined to, training, population census, mapping, agricultural crop assessment and forecasting, mineral resource evaluations, etc. In view of the importance of U.S. Landsat data to numerous U.S. Government space

technology assistance programs, the private Landsat owner(s)/operator(s) shall be prepared to sell data from their Landsats, upon request by the U.S. Government agencies, in order to ensure adequate U.S. Government participation in international space technology assistance programs. Futhermore, NASA has included foreign participants in its research programs to broaden the base of expertise available and also to ensure the collection of ground truth. Such foreign participants in U.S. Government research programs must continue to have operational remote sensing data made available to them on the same terms as such data is made available to U.S. participants in U.S. Government research programs.

(2) Procedures

Private Landsat owner(s)/operator(s) should be prepared to sell data to U.S. Government agencies in order to ensure those agencies adequate data to meet their space technology assistance and other international programmatic needs. Such agencies will endeavor to inform the private owner(s)/operator(s) of forthcoming requirements through the Government oversight mechanism described in Section III.

(3) Proposal Requirements

A proposal for the Landsats shall address in this part the manner in which data will be provided from privately operated satellites to fulfill the international data requirements outlined above.

(e) Foreign Landsat Ground Stations

(1) Obligations

Any private operator of the civil Landsat system must determine the disposition of the existing foreign Landsat ground stations. Over the past decade, the U.S. has actively encouraged the participation of foreign entities in the civil Landsat program. Participation has taken the form of a dozen ground data receiving/processing/transmission stations. Retention of exisiting arrangements with foreign Landsat ground stations is not a condition of private ownership/operation of the civil Landsat program per se. However, a private operator shall obtain the concurrence of the U.S. Government before terminating or initiating agreements with an existing or prospective foreign Landsat ground station operator, or making changes in operational procedures which could adversely affect U.S. foreign policy interests.

(2) Procedure

A private Landsat owner/operator shall obtain the concurrence of the U.S. Government before terminating or initiating agreements with an existing or prospective foreign Landsat ground station operator, and obtain concurrence prior to making changes in operational procedures which could adversely effect U.S. foreign policy interests.

(3) Proposal Requirements

A proposal for the Landsat system shall address the procedures planned for operation of current and future Landsat ground stations and retention and/or closure of existing foreign Landsat stations.

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SECTION VII.9 NATIONAL SECURITY

The Department of Defense is interested in Civil Satellite Systems data and technological applications. The DOD expects to continue to have access to and use data as it becomes available. The requirements necessary to ensure that this data continues to be available for DOD use are contained in Appendix A. These requirements must be met or the proposal will be considered non responsive.

SECTION VIII GOVERNMENT CONTRACT EXPERIENCE AND COMMERCIALIZATION PLAN

Historical, financial, staffing, and legal information is requested here to assess the company's ability and capacity to perform. A commercialization plan, in considerable detail, is requested to evaluate the company's ability to establish a viable commercial operation.

SECTION VIII

GOVERNMENT CONTRACT EXPERIENCE

AND COMMERCIALIZATION PLAN

INTRODUCTION

Proposing Entity

All information submitted shall consist of relevant experience of the offering entity designated as the organizational element that is responsible for contract performance.

Evaluation will be made for this offering entity. If the offering entity does not have directly relatable experience (for instance, because it may be a newly formated joint venture, or because it may be a new unit within an established company), the offeror must provide sufficient information to show the experience of the organizational elements being grouped together to form the organization. This information shall be described as "General Company Information" of the offering entity. The person signing the proposal must have the authority to commit the offeror to all provisions of the offer. All required information and data must be submitted with the proposal and in the format indicated. All data should have full and complete backup information.

Evaluation of Information

For offeror's proposals involving only cost type arrangements, Government Contract Experience and Subcontracting Plan will be evaluated in three categories: Level of Experience, Past Performance Factors, and Other Factors. These evaluation factors, while not weighted or presented in any relative order of importance, will be considered in the selection of an offeror for negotiation of a contract.

The information requested in this RFP, together with information that the Source Evaluation Board may acquire from Government and commercially available data, will provide the information for the Experience, Past Performance, and Other Factors evaluation.

Proposals must include a Commercialization Plan, the plan will be evaluated as described in Section XI, Evaluation of Proposals.

A. Government Contract Experience

A.1 General Contract Performance History

Describe prior experience in serving as Contractor under a major Federal contract to include:

A.1.1 General performance history;

A.1.2 Cost management history, describing any cost overruns on fixed price contracts or cost increases under a cost plus fixed fee arrangement;

A.1.3 Termination or cancellation history; and

A.1.4 Planning and control systems used for Government contracts.

B. Subcontracting Plan

List any subcontractors who would be involved under the proposed contract. The successful offeror will be required to submit a detailed subcontracting plan for small business and small disadvantaged business, as described in Section III, Information to Offerors.

C. Commercialization Plan

Commercialization of the civil environmental remote sensing satellites to the maximum extent is a major objective of this solicitation. In order to assess the degree of commercialization which may result, each offeror will provide details of his proposed private sector/government business relationship and his approach to achieving commercialization.

Offerors must include as a part of the proposal, a commercialization plan which will be prepared in accordance with the outline provided below.

C.1 Offeror's General Strategy to Achieve Commercialization

C.1.1 Corporate Mission: Outline the goals of your organization regarding owning, operating, and maintaining Remote Sensing Satellite Systems and the objectives and strategies that the organization will pursue.

C.1.2 Corporate Strategy to Achieve Commercialization: Summarize the organization's strategy for achieving commercialization.

C.2 Financial Plan

C.2.1 Financial Statements: Provide the most recent 10K Report and the most recent annual audited financial statements and detailed supporting schedules, to include:

C.2.1.1 Income Statement

C.2.1.2 Balance Sheet

C.2.1.3 Statement of Changes in Financial Position

C.2.2 Foreign Ownership, Control, or Influence: Provide information which discloses the existence and the degree of ownership, control, or influence on the firm by a foreign interest. Please include:

C.2.2.1 The amount a foreign interest owns of the firm.

C.2.2.2 The amount the organization is indebted to foreign interests.

C.2.2.3 The extent to which the firm owns any foreign interest in whole or in part.

C.2.3. Pro Forma Financial Statements: For each year of the contract, submit the consolidated pro forma financial statements for the parent company as listed below. For each of the satellite programs being bid, submit pro forma statements in the formats shown in Exhibits VIII-C-1 through VIII-C-5.

Provide a narrative of all economic assumptions used, e.g., rate of inflation, interest rates, GNP, CPI, credit availability, sources of financing, etc. Describe the source of the assumptions (internally generated and/or outside sources). Also include all significant financial statement assumptions used in preparation of the pro forma financial statements and supporting schedules.

C.2.3.1 Income Statement

C.2.3.2 Balance Sheet

C.2.3.3 Statement of Changes in Cash

C.2.3.4 Long Term Capital Requirements-R&D

C.2.3.5 Schedule of Depreciation and Amortization

C.2.4 Financial Ratios: Provide financial ratios for the most recent annual financial statements and for the pro forma financial statements in the format provided in Exhibits VIII-C-6 and VII-C-7. Include the numbers used in each of the formula computations. The ratios to be calculated are:

C.2.4.1 Short Term Liquidity Ratios

C.2.4.1.a Current Ratio

C.2.4.1.b Funds Flow Adequacy Ratio

C.2.4.2 Capital Structure and Long Term Solvency Ratios:

C.2.4.2.a Total Debt to Total Capital

C.2.4.2.b Total Debt to Equity

C.2.4.2.c Total Debt Service Charge

C.2.4.2.d Funds Flow Coverage of Fixed Charges

C.2.4.2.e Earnings Coverage of Fixed Charges

C.2.4.2.f Working Capital Provided by Operations

C.2.4.3 Return On Investment Ratios:

C.2.4.3.a Return on Investment

C.2.4.3.b Return on Total Assets

C.2.4.4 Operating Performance Ratios:

C.2.4.4.a Net Profit Margin

C.2.4.5 Asset Utilization Ratios:

C.2.4.5.a Sales to Working Capital

C.2.4.5.b Sales to Fixed Assets

C.2.4.5.c Sales to Total Assets

C.2.5 Risk Analysis: Offeror must provide an assessment of the risks and uncertainties of the proposed venture and the impact on both the proposed entity and the segment or line of business of the parent corporation.

C.2.5.1 Qualitative Risk Assessment: Include a narrative of the major areas of risk forseen in the proposed venture (e.g., likely future problems and opportunites that will influence it). Discuss contingency steps which could and would be taken by firm in the event that goals could not be reached.

C.2.5.2 Quantitative Risk Assessment (optional): Provide a quantitative assessment of the risk of the proposed venture. This may include probabilistic analyses which require a discussion of all the assumptions used in the model.

C.3 Marketing Plan

C.3.1 Analysis of the Marketplace: Provide a market analysis of the demand for data and products from remote sensing satellite systems to include:

C.3.1.1 Customers: Identify potential types and numbers of customers for each segment.

C.3.1.1.a U.S. Federal, State, and Local Government

C.3.1.1.b Domestic Private Sector

C.3.1.1.c Foreign Governments

C.3.1.1.d Foreign Corporations

C.3.1.2 Market Size and Trends: Define the potential volume and revenues of the market and its future trends. Include specific information regarding the following:

C.3.1.2.a Assumptions: Describe assumptions used in determining the potentials of the market.

C.3.1.2.b Market Projections: Include market projections by segment, and by product line and, by product for the term of the contract.

C.3.1.3 Competition: Give a narrative description of the general outlook for the competitive environment. Also include:

C.3.1.3.a Competitors: Identify the major and viable competitors in the marketplace.

C.3.1.3.b Competitive Positioning: Describe the company's strengths vis a vis the competitors.

C.3.2 Products/Services: Identify and define the products/services anticipated to be provided to the marketplace.

C.3.2.1. Integration: Describe how these products/services will be integrated into the firm's current product services mix.

C.3.3 Distribution: Describe how data and products will be distributed to the different types of customers by specifically addressing the following:

C.3.3.1 Existing Method of Distribution: Describe any existing methods of distribution which would be used to support the new venture.

C.3.3.2 New Method of Distribution of Data and Products: Describe new methods of distribution which may be developed to support the new venture products.

C.3.4 Marketing Strategy: Briefly state the overall marketing strategy which describes the firm's decisions about market targets, and selection of objectives, and choices regarding how the marketing mix components will be used to achieve the objectives.

C.3.4.1 Assumptions re Future Conditions: Provide a narrative discussing the various assumptions used in defining specific and realistic marketing objectives.

C.3.4.2 Marketing Objectives: Define specific marketing objectives which are consistent with corporate objectives (e.g. for each target market, state in term of sales, etc).

C.3.4.3 Marketing Program: Describe the marketing program established for achieving those objectives. This should consist of defined subobjectives within each of the following functional areas:

C.3.4.3.a Pricing for Landsat: (For informational purposes only: See Exhibit VIII-C-8)

C.3.4.3.b Product/Service Mix

C.3.4.3.c Sales Approach

C.3.4.3.d Customer Service

C.3.4.3.e R&D and Product Development

C.3.5 Marketing Organization: Describe how the marketing organization will be structured in order to achieve the marketing strategy and objectives.

C.4 Management Plan

C.4.1 Organization Structure: Include information with regard to each of the following:

C.4.1.1 Organization Chart: Provide an organization chart for the offering entity which depicts the major functions to be performed. Indicate for each function:

C.4.1.1.a Detailed Description of Responsibilities

C.4.1.1.b Names of all Key Personnel

C.4.1.1.c Number of Staff by Function

C.4.1.2 Key Personnel Qualifications and Past Performance: The individual qualifications and past performance record for each individual shall be included. A written resume shall be provided for each designated Key Person, summarizing, as a minimum, the individual's work experience for the past ten (10) years; experience with relevant systems as appropriate and specfic qualifications for the position proposed. Each resume shall list the name(s) and current address and telephone numbers of at least three (3) references knowledgeble of the individual's work history and experience. For the purposes of the contract, key personnel are designated in the Terms and Condition of the Contract and cannot be changed or replaced without prior approval of the contracting authority. The following will be identified as key personnel:

SHOULD REVIEW

C.4.1.2.a Project Manager: The senior organization manager charged with the daily operation of the Project or operating organization proposed. He(she) bears full responsibility for the execution of the contract. A Top Secret Security clearance is mandatory.

C.4.1.2.b Business Manager: The senior organization manager charged with the business and accounting procedures of the contract. This will include the establishment and modification of any fee structure for data or data products and fiscal reporting under the terms of the contract.

C.4.1.2.c Marketing Manager: The senior manager charged with developing, implementing and conducting the proposed marketing organization for the system proposed.

C.4.1.2.d Chief Operational Scientist or senior scientist charged with establishing and maintaining the required data flow to meet government requirements; implementing changes to the system or data products to meet new data needs of either the government or commerical entities. A Top Secret clearance is mandatory.

C.4.1.2.e National Security Liasion Manager: The senior project official charged with any proposed government interface for national security matters. A Top Secret clearance is mandatory.

C.4.1.2.f International Liasion Manager: Serves as the principal interface for the contractor organization and selected agencies of the Federal government in matters of international concern and operations. A Top Secret security clearance is mandatory.

C.4.1.2.g Corporate Officers: Identify the officers of the existing corporation or the new enterprise formed for the purposes of this proposal.

C.4.1.3 Legal Organization: Describe the legal organization of the entity, e.g., consolidated subsidiary, division of existing corporate entity, limited partnership.

C.4.2 Organization Experience: Describe in detail prior corporate experience that demonstrates the ability to successfully operate and manage a similar new venture. Provide three (3) examples which relate to the firm's experience in acquisition.

C.4.3. Transition Plan: Describe the methods, procedures, and plans for the transition from government operation to contractor operation for the associated satellite, ground equipment, and ground operations. Exhibit VIII-C-9 includes the current satellites in orbit or under contract and their nominal lifetimes together with the associated ground equipment. Note that Landsat D" is not an approved mission at this writing.

Many of the present ground station operations are conducted by contract arrangements as described in the site visits and associated documentation. Various elements of the ground systems are physically located at government installations. An offeror should not assume or require government transfer of real property; however, other arrangements for the transition period are solicited.

C.4.3.1 Transition Plan Requirements: As a minimum, the offerors plan for transition of the systems specified under this RFP from a U.S. Government

owned and operated entity to a commercially owned and operated system, shall address the following issues:

C.4.3.1.a Management Plan: Submit plan for initiation of the management function and implementation of administrative functions upon contract award.

C.4.3.1.b Staffing Plan

C.4.3.1.c Training

C.4.3.1.d Schedule, Including Milestones

C.4.3.1.e Spacecraft Launching

C.4.3.1.f Spacecraft Handover

C.4.3.1.6 Transfer of space and ground equipment, including current system products.

C.4.3.1.h Transfer of present operations, maintainence and communication services contracts

C.4.3.1.i Facility and Real Property Arrangements

C.4.3.1.j Government/Contractor Liabilities during Transition

C.4.4 Potential Disposition of U.S. Government Assets

The following table presents the usual acceptable business arrangements for the disposition of U.S. Government-owned assets within the scope and documented in the accompanying Financial Statements to the RFP. Alternative business arrangements may be proposed in response to this RFP.

Acceptable Business Arrangement

Type of Asset	Sale*	Lease	GFE**	Short-Term Joint-use Agreement
All Landsat Satellites	Yes	Yes	Yes	N/A
Ground Systems, Spare Parts, and Supplies				
1) Command & Control, GSFC, Bldg. 28	Yes	Yes	Yes	N/A
2) MSS Preprocessing, GSFC,	Yes	Yes	Yes	N/A
Facilities (Buildings & Land)				
For Landsat ?				
→ 1) DCS, WWB	No	Yes	No	N/A
2) GSFC, Bldg. 28	No	Yes	No	N/A

*For Cash or Other Consideration.
**Government-furnished equipment.

Exhibit VIII-C-1

Satellite Program _____
Pro Forma Income Statement

(000's)

ITEMS :	YEARS		
Revenues:	19x1	19x2	19x3
(Specify by Source)			
Expenses:			
Operating Expenses:			
Cost of Sales			
Salaries, Wages & Benefits			
Contractual Services			
Travel & Transportation			
Depreciation & Amortization			
Rent, Communication & Utilities			
Supplies & Other (specify)			
General & Administrative:			
Salaries, Wages & Benefits			
Contractual Services			
Travel & Transportation			
Depreciation & Amortization			
Rent, Communication & Utilities			
Supplies & Other (specify)			
Research & Development			
Operating Income			
Miscellaneous Income			
Total Income Before Interest Expense			
Interest Expense			
Less: Interest Capitalized			
Income Before Taxes			

Exhibit VIII-C-2

Satellite Program
Pro Forma Balance Sheet

(000's)

	YEARS		
ASSETS	19x1	19x2	19x3
Current Assets:			
Cash			
Receivables			
Inventories			
Prepaid Expenses			
Total Current Assets			
Fixed Assets:			
Property, Plant & Equipment (specify in detail)			
Less: Accumulated Depreciation & Amortization			
Net Fixed Assets			
Investments and Other Assets (specify in detail)			
Deferred Charges (Net of Amortization) (specify in detail)			
Total Assets			
LIABILITIES			
Current Liabilities:			
Notes Payable			
Accrued Expenses			
Income Taxes -- Including Deferred Taxes and Income Tax Credits			
Total Current Liabilities			
Long-Term Liabilities:			
Deferred Income Taxes			
Other Deferred Credits (specify)			
Long-Term Debt			
Stockholder Investment			
Preferred Stock			
Common Stock and Paid-In Capital			
Retained Earnings			
Total Liabilities and Net Worth			

Exhibit VIII-C-3

Satellite Program
Pro Forma Statement of Changes in Cash
(000's)

SOURCE OF CASH	YEARS		
Internally Generated Funds:	19x1	19x2	19x3
Net Income			
Depreciation & Amortization			
Deferred Income Taxes: Non-Current Portion			
Total from Operations			
Issuance of Capital Stock			
Increase in Long-Term Debt			
Decrease in Investment and Other Assets			
Property Sales and Retirements			
Decrease in Deferred charges			
Increase in Deferred Credits			
Other-Net (specify)			
Working Capital Changes Detailed below-Decrease			
Total			
USES OF FUNDS			
Increase in Investment and other Assets			
Reduction of Long-Term debt			
Cash Dividend on Capital Stock			
Increase in Deferred Charges			
Decrease in Deferred Credits			
Other-Net (specify)			
Working Capital Changes Detailed Below-Increase			
Increase (Decrease) in Cash			
Working Capital other than Cash & Marketable Securities			
Represented By:			
Current Assets - Increase (Decrease)			
Receivables			
Inventories			
Prepaid Expenses			
Change in Current Assets			
Current Liabilities-Increase (Decrease)			
Notes Payable			
Current Portion of Long-Term Debt			
Accounts Payable			
Accrued Expenses			
Current Income Taxes:			
Amount Payable			
Deferred			
Change in Current Liabilities			
Increase (Decrease) in Working Capital			

Exhibit VIII-C-4

Satellite Program_____
Pro Forma Long-Term Capital Requirements-R&D

(000's)

R&D Programs:	Years Investment	Less: Amount Capitalized	Add: Amortization of Prior Years Capitalized Amounts	P&L Net Changes for R&D for the Year

Satellite Program
Pro Forma Statement of Depreciation & Amortization

(000's)

Cost:

Category:	Balance Beginning Year	Depreciation Expense (Additions)	(Dispositions)	Other	Balance End Year
Satellite					
Building					
Eqiupment					
Telecommunications					
ADP					
Other (specify in detail)					

Depreciation:

Category:	Balance Beginning Year	Additions	(Dispositions)	Other	Balance End Year
Satellite					
Building					
Equipment					
Telecommunications					
ADP					
Other (specify in detail)					

Satellite Program: _____

Program Financial Ratios of Current Financial Position Analysis

RATIO	COMPUTATION	19x1	19x2
1. Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$		
2. Funds Flow Adequacy Ratio	$\frac{\text{Five-Year Sum of Sources of Funds from Operations}}{\text{Five-Year Sum of Capital Expenditures, Inventory Additions, and Cash Dividends}}$		
3. Total Debt to Total Capital	$\frac{\text{Current Liabilities and Long-Term Liabilities}}{\text{Equity Capital and Total Liabilities}}$		
4. Total Debt to Equity	$\frac{\text{Current Liabilities and Long-Term Liabilities}}{\text{Equity Capital}}$		
5. Total Debt Service Charge	$\frac{\text{Income Before Taxes + Inteest Expenses + Depreciation and Lease Obligation}}{\text{Interest Expense + Lease Obligations + Principal Repayments}}$		
. Return on Investment	$\frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$		
7. Return on Total Assets	$\frac{\text{Net Income \& Interest Expenses (1-tax rate) + Minority Interest in Earnings}}{\text{Average Total Assets}}$		
8. Net profit Margin	$\frac{\text{Net Profit After Taxes}}{\text{Sales}}$		
9. Return on Investment	$\frac{\text{Net Income \& Interest Expense (1-tax rate) + Minority Interest in Earnings}}{\text{Average Total Assets}}$		
10. Net Profit Margin	$\frac{\text{Net Profit After Taxes}}{\text{Sales}}$		
11. Sales to Working Capital	$\frac{\text{Sales}}{\text{Working Capital}}$		
12. Sales to Fixed Assets	$\frac{\text{Sales}}{\text{Fixed Assets}}$		
13. Sales to Total Assets	$\frac{\text{Sales}}{\text{Total Assets}}$		

Satellite Program: _____

Program Financial Ratios of Current Financial Position Analysis

RATIO	COMPUTATION	19x1	19x2
1. Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$		
2. Funds Flow Adequacy Ratio	$\frac{\text{Five-Year Sum of Sources of Funds from Operations}}{\text{Five-Year Sum of Capital Expenditures, Inventory Additions, and Cash Dividends}}$		
3. Total Debt to Total Capital	$\frac{\text{Current Liabilities and Long-Term Liabilities}}{\text{Equity Capital and Total Liabilities}}$		
4. Total Debt to Equity	$\frac{\text{Current Liabilities and Long-Term Liabilities}}{\text{Equity Capital}}$		
5. Total Debt Service Charge	$\frac{\text{Income Before Taxes + Inteest Expenses + Depreciation and Lease Obligations}}{\text{Interest Expense + Lease Obligations + Principal Repayments}}$		
6. Funds Flow Coverage of Fixed Charges	$\frac{\text{Funds Provided by Operations + Fixed Charges}}{\text{Fixed Charges}}$		
7. Earnings Coverage of Fixed Charges	$\frac{\text{Income Before Taxes + Fixed Charges}}{\text{Fixed Charges}}$		
8. Return on Investment	$\frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$		
9. Sales to Working Capital	$\frac{\text{Sales}}{\text{Working Capital}}$		
10. Sales to Fixed Assets	$\frac{\text{Sales}}{\text{Fixed Assets}}$		
11. Sales to Total Assets	$\frac{\text{Sales}}{\text{Total Assets}}$		

For informational purposes only, offerors who propose to perform Landsat work under a service contract arrangement and offer a commerical price for Landsat products to all others, are asked to provide an estimated price for each of the following items.

LANDSAT PRICING SCHEDULE

MSS DATA PRODUCTS

I. Film Products

A. Black and White (of individual bands)

	SCALE	MATERIAL	NOMINAL IMAGE SIZE (Inches)	EACH
1.	1:1,000,000	Paper	7.3	$_____
2.	1:1,000,000	Film Positive	7.3	$_____
3.	1:1,000,000	Film Negative	7.3	$_____
4.	1:500,000	Paper	14.6	$_____
5.	1:250,000	Paper	29.2	$_____

B. False - Color Composites

6.	1:1,000,000	Paper	7.3	$_____
7.	1:1,000,000	Film Negative	7.3	$_____
8.	1:500,000	Paper	14.6	$_____
9.	1:250,000	Paper	29.2	$_____

II. Computer-compatible Tapes (CCTS)

A. Geometrically corrected. $_____
B. Not geometrically corrected $_____

TM DATA PRODUCTS

I. Film Products

A. Black and White (of individual bands)

	SCALE	MATERIAL	NOMINAL IMAGE SIZE(Inches)	EACH
1.	1:750,000	Paper	7.3	$_____
2.	1:750,000	Film Positive	7.3	$_____
3.	1:750,000	Film Negative	7.3	$_____
4.	1:375,000	Paper	14.6	$_____
5.	1:875,000	Paper	29.2	$_____

B. Natural-color and False - color composites

6.	1:750,000	Paper	7.3	$_____
7.	1:750,000	Film Negative	7.3	$_____
8.	1:375,000	Paper	14.6	$_____
9.	1:187,000	Paper	29.2	$_____

II. Computer-compatible Tapes (CCTS)

A. Geometrically corrected $_____

Exhibit VIII-C-9

ANTICIPATED USEFUL LIFE

REMOTE SENSING SATELLITES AND GROUND STATIONS

LANDSAT

SATELLITES		GROUND SYSTEMS
	ANTICIPATED SERVICE LIFE	USEFUL LIFE
Landsat-4	1982-1984	
Landsat-D'	1984-1987	1982-1992

SECTION IX Financial Statements

This includes the Independent Public Accounting firm's Financial Statement on the Landsat and Metsat systems. Included in the final Solicitation will also be a summary listing of all the Government property available for sale with each system or to be used by a sucessful contractor in performance of a traditional Government service contract.

DRAFT

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

SATELLITE PROGRAMS

FINANCIAL STATMENTS

FOR THE PERIODS ENDED MARCH 31, 1983
AND SEPTEMBER 30, 1982 AND 1981

TENTATIVE - SUBJECT TO CHANGE

Section would have To be re-written and re-calculated for Landsat only. Probably need a new contract with Immediate Post Entire section removed for this Draft JW

SECTION X COST PROPOSAL

Pre-printed forms are included here to assist bidders in documenting their estimated costs and to show how they arrived at their total cost or price.

SECTION X

Cost Proposal

A.1. Offerors will indicate their total offer for assuming ownership and responsibility for the following:

Landsat Satellite System $_____
(or Other Consideration)

Offerors will indicate their total offer. All tangible property and assets which are currently being used for performance and which are available for sale for each system are shown in Section IX (Financial Statements), Section VIII (Contractor Experience and Commercialization Plan), and more detailed documents in the reading room.

Offerors may purchase none, some, or all of the items shown as available. Please indicate what items are to be included for your offer.

A.2. Alternatively, offerors will indicate their total price to the Government for operation and maintenance of the satellite system during the transition, before transfer to private contractor ownership:

Landsat Satellite System $_____

B. In addition, offerors will indicate their price to the Government for data and services to be provided (see Section VII) after the transfer to private contractor ownership.

Cost Factors

A. The probable cost impact on the Government of the offeror's proposal is considered as being of substantially equal importance to the Evaluation Factors listed in Section XI.

B. Cost factors are those which indicate the validity, realism, and adequacy of each proposal and the probable cost that will be incurred in performance of this effort. Probable cost differences among proposals and their causes, such as differences in business methods and operating procedures and practices, will also be evaluated.

C. Cost realism and supporting rationale (or lack thereof) will enter into the Government's assessment of each offeror's (1) understanding of the requirements included in this RFP, and (2) ability to provide/maintain a stable base for performance of the contemplated contract.

D. The evaluation of Cost Factors will include an assessment of the cost of doing business with each offeror.

This form is for use when (i) submission of cost or pricing data (see FPR 1-3.807-3) is required and (ii) submission for the Optional Form 59 is authorized by the contracting officer.

PAGE NO.	NO OF PAGES

NAME OF OFFEROR	SUPPLIES AND/OR SERVICES TO BE FURNISHED
HOME OFFICE ADDRESS	

DIVISION(S) AND LOCATION(S) WHERE WORK IS TO BE PERFORMED	TOTAL AMOUNT OF PROPOSAL	GOVT SOLICITATION NO.
	$	

DETAIL DESCRIPTION OF COST ELEMENTS

			EST COST ($)	TOTAL EST COST*	REFERENCE*
1. DIRECT MATERIAL (Itemize on Exhibit A)					
a. PURCHASED PARTS					
b. SUBCONTRACTED ITEMS					
c. OTHER—(1) RAW MATERIAL					
(2) YOUR STANDARD COMMERCIAL ITEMS					
(3) INTERDIVISIONAL TRANSFERS (At other than cost)					
TOTAL DIRECT MATERIAL					
2. MATERIAL OVERHEAD* (Rate % Base)					
3. DIRECT LABOR* (Specify)	ESTIMATED HOURS	RATE/ HOUR	EST COST ($)		
TOTAL DIRECT LABOR					
4. LABOR OVERHEAD (Specify Departments or Cost Centers)*	O.H. RATE	$ Base	EST COST ($)		
TOTAL LABOR OVERHEAD					
5. SPECIAL TESTING (Including field work at Government installations)			EST COST ($)		
TOTAL SPECIAL TESTING					
6. SPECIAL EQUIPMENT (If direct charge) (Itemize on Exhibit A)					
7. TRAVEL (If direct charge) (Cost should be consistent with Invoices)			EST COST ($)		
a. TRANSPORTATION					
b. PER DIEM OR SUBSISTENCE					
TOTAL TRAVEL					
8. CONSULTANTS (Identify—particularly if Government)			EST COST ($)		
TOTAL CONSULTANTS					
9. OTHER DIRECT COSTS (Itemize on Exhibit A)					
10. TOTAL DIRECT COST AND OVERHEAD					
11. GENERAL AND ADMINISTRATIVE EXPENSE (Rate % of total cost input Item) *					
12. ROYALTIES *					
13. TOTAL ESTIMATED COST					
14. FEE OR PROFIT					
15. TOTAL ESTIMATED COST AND FEE OR PROFIT					

OPTIONAL FORM 60
(October 1971)
General Services Administration
FPR 1-16.8(b)

This proposal is submitted for use in connection with and in response to (Describe RFP. no.)

and reflects our best estimates as of this date, in accordance with the Instructions to Offerors and the Footnotes which follow.

TYPED NAME AND TITLE	SIGNATURE

NAME OF FIRM	DATE OF SUBMISSION

EXHIBIT A—SUPPORTING SCHEDULE (Specify. If more space is needed, use reverse)

COST EL. NO.	ITEM DESCRIPTION (See footnote 5)	EST COST ($)

I. HAS ANY EXECUTIVE AGENCY OF THE UNITED STATES GOVERNMENT PERFORMED ANY REVIEW OF YOUR ACCOUNTS OR RECORDS IN CONNECTION WITH ANY OTHER GOVERNMENT PRIME CONTRACT OR SUBCONTRACT WITHIN THE PAST TWELVE MONTHS?

☐ YES ☐ NO (If yes, identify below.)

NAME AND ADDRESS OF REVIEWING OFFICE AND INDIVIDUAL	TELEPHONE NUMBER/EXTENSION

II. WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS PROPOSED CONTRACT?

☐ YES ☐ NO (If yes, identify on reverse or separate page)

III. DO YOU REQUIRE GOVERNMENT CONTRACT FINANCING TO PERFORM THIS PROPOSED CONTRACT?

☐ YES ☐ NO (If yes, identify.): ☐ ADVANCE PAYMENTS ☐ PROGRESS PAYMENTS OR ☐ GUARANTEED LOANS

IV. DO YOU NOW HOLD ANY CONTRACT (Or, do you have any independently financed (IR&D) projects) FOR THE SAME OR SIMILAR WORK CALLED FOR BY THIS PROPOSED CONTRACT?

☐ YES ☐ NO (If yes, identify.):

V. DOES THIS COST SUMMARY CONFORM WITH THE COST PRINCIPLES SET FORTH IN AGENCY REGULATIONS?

☐ YES ☐ NO (If no, explain on reverse or separate page)

See Reverse for Instructions and Footnotes

OPTIONAL FORM 60 (10-

2

INSTRUCTIONS TO OFFERORS

1. The purpose of this form is to provide a standard format by which the offeror submits to the Government a summary of incurred and estimated costs (and attached supporting information) suitable for detailed review and analysis. Prior to the award of a contract resulting from this proposal the offeror shall, under the conditions stated in FPR 1-3.807-3 be required to submit a Certificate of Current Cost or Pricing Data (See FPR 1-3.807-3(h) and 1-3.807-4).

2. In addition to the specific information required by this form, the offeror is expected, in good faith, to incorporate in and submit with this form any additional data, supporting schedules, or substantiation which are reasonably required for the conduct of an appropriate review and analysis in the light of the specific facts of this procurement. For effective negotiations, it is essential that there be a clear understanding of:

a. The existing, verifiable data.
b. The judgmental factors applied in projecting from known data to the estimate, and
c. The contingencies used by the offeror in his proposed price.

In short, the offeror's estimating process itself needs to be disclosed.

3. When attachment of supporting cost or pricing data to this form is impracticable, the data will be described (with schedules as appropriate), and made available to the contracting officer or his representative upon request.

4. The formats for the "Cost Elements" and the "Proposed Contract Estimate" are not intended as rigid requirements. These may be presented in different formats with the prior approval of the Contracting Officer if required for more effective and efficient presentation. In all other respects this form will be completed and submitted without change.

5. By submission of this proposal the offeror grants to the Contracting Officer, or his authorized representative, the right to examine, for the purpose of verifying the cost or pricing data submitted, those books, records, documents and other supporting data which will permit adequate evaluation of such cost or pricing data, along with the computations and projections used therein. This right may be exercised in connection with any negotiations prior to contract award.

FOOTNOTES

1 Enter in this column those necessary and reasonable costs which in the judgment of the offeror will properly be incurred in the efficient performance of the contract. Where any of the costs in the columns have already been incurred (e.g., on a letter contract or change order), describe them on an attached supporting schedule. Identify all costs and transfers between your plants, divisions, or organizations under a common control, which are intended at other than the lowest of cost to the original transferor or current market price.

2 Where space in addition to that available in Exhibit A is required, use such separate pages as necessary and identify in the "Reference" column the schedule on which the information supporting the specific cost element may be found. No standard format is prescribed; however, the cost or pricing data must be accurate, complete and current, and the judgmental factors used in projecting from the data to the estimate must be stated in sufficient detail to enable the Contracting Officer to evaluate the proposal. For example, provide the basis used for pricing materials (such as by vendor quotations, shop estimates, or previous prices; the reason for use of overhead rates which deviate significantly from experienced rates (reduced volume, a planned major rearrangement, etc.)); an explanation for an increase in labor rates (anticipated wage and salary increases, etc.). Identify and explain any contingencies which are included in the proposed price, such as anticipated costs of rejects and defective work, or anticipated technical difficulties.

3 Indicate the rates used and provide an appropriate explanation. Where agreement has been reached with Government representatives on the use of forward pricing rates, describe the nature of the agreement. Provide the method of computation and application of your overhead expense, including cost breakdowns and showing trends and budgetary data as necessary to provide a basis for evaluation of the reasonableness of proposed rates.

4 If the total cost entered here is in excess of $250, provide on a separate page the following information on each separate item of royalty or license fee: name and address of licensor; date of license agreement; patent numbers, patent application serial numbers, or other basis on which the royalty is payable; brief description, including any part or model numbers of each contract item or component on which the royalty is payable; percentage or dollar rate of royalty per unit; unit price of contract item; number of units; and total dollar amount of royalties. In addition, if specifically requested by the contracting officer, a copy of the current license agreement and identification of applicable claims of specific patents shall be provided.

5 Provide a list of proposed items written each category indicating known or anticipated sources, quantity, unit price, total price amount, and basis of establishing source and reasonableness of cost.

CONTINUATION OF EXHIBIT A—SUPPORTING SCHEDULE AND REFUSES TO QUESTIONS 3 AND 5.

CERTIFICATE OF CURRENT COST OR PRICING DATA

This is to certify that, to the best of my knowledge and belief, cost or pricing data (1) submitted in writing, or specifically identified in writing if actual submission of the data is impracticable (see 1-3.807-3(h)(2)), to the Contracting Officer or his representative in support of _____(2) are accurate, complete, and current as of _____. (3)

Firm _____
Name _____
Title _____

Date of Execution _____ Signature _____

(1) For definition of "cost or pricing data", see FPR 1-3.807-3.
(2) Describe the proposal, quotation, request for price adjustments, or other submission involved, giving appropriate identifying number (e.g., RFP No.).
(3) This date shall be the date when the price negotiations were concluded and the contract price agreed to. The responsibility of the contractor is not limited by the personal knowledge of the contractor's negotiator if the contractor had information reasonably available (see 1-3.807-5(a)) at the time of agreement, showing that the negotiated price is not based on accurate, complete, and current data.

SECTION XI EVALUATION OF PROPOSALS

The factors that will be judged and evaluated are shown here.

SECTION XI

Proposal Evaluation

Proposals will be evaluated to determine those offers that are acceptable or capable of being made acceptable. After acceptability has been determined, a competitive range determination will be made.

Negotiations will be conducted only with those offerors determined to be in the competitive range.

Evaluation Factors

All proposals will be evaluated for the followng factors:

1. Understanding the Requirements (including National Security Requirements)
2. International Requirements
3. Commercialization Plan
4. Technical Management
5. Other Factors

The Factor, "Understanding the Requirements," consider the extent to which the Government data requirements are met, including the National Security requirements, the provisions for system continuity and system improvements and innovation.

"Technical Management" as an Evaluation Factor will consider the qualifications and experience of key personnel, the proposed organization and methods and procedures for the stipulated Government interfaces.

"Other Factors" cover the Offeror's financial condition and capability, the priority placed by the Offeror on the effort proposed, stability of labor-management relations and the extent of small business and minority enterprise participation

For the Landsat satellite system, the most important factor for the evaluation is, Understanding the Requirements, followed in importance by Commercialization Plan, International Requirements, Technical Management, and other factors in that order.

Supplementary Evaluation Criteria

(a) Total Compensation Plan (Professional Employees). In establishing compensation levels for professional employees, the total compensation (both salaries and fringe benefits) proposed shall

reflect a clear understanding of the requirements of the work to be accomplished and the suitability of the proposed compensation structure to obtain and retain qualified personnel to meet mission objectives. The salary rates or ranges must recognize the distinct differences in professional skills and the complexity of varied disciplines as well as job difficulty. Proposals offering total compensation levels less than currently being paid by other contractors for the same work will be evaluated, in addition to the above, on the basis of maintaining program continuity, uninterrupted work of high quality, and availability of required competent professional employees. Offerors are cautioned that instances of lowered compensation for essentially the same professional work may be considered a lack of sound management judgment in addition to indicating a lack of understanding of the requirement.

(b) Cost (Professional Compensation). Proposals which are unrealistically low or do not reflect a reasonable relationship of compensation to the professional job categories so as to impair the contractor's ability to recruit and retain competent professional employees, may be viewed as reflecting a failure to comprehend the complexity of the contract requirements. The Government is concerned with the quality and stability of the work force to be employed on this contract. The compensation data required will be used in evaluation of the offeror's understanding of the contract requirements.

(c) Other (Labor Relations). An assessment of the potential for adverse effect upon performance and maintenance of the required number of professional employees with requisite skills resulting from an unrealistically low compensation structure will also be made.

ACRONYMS

AARS	Automated Aircraft Reporting System
ACS	Automated Command System
AFGL	Air Force Geophysics Laboratory
AFGWC	Air Force Global Weather Central
AID	Agency for International Development
AMSU	Advanced Microwave Sounding Unit
APT	Automatic Picture Transmission
ARGOS	The NOAA Data Collection and Platform Location System (provided by France)
ATN	Advanced TIROS-N
ATS	Applications Technology Satellite
AVHRR	Advanced Very High Resolution Radiometer
CCF	Central Computer Facility
CCT	Computer Compatible Tape
CDA	Command and Data Acquisition Station
CDDF	Central Data Distribution Facility
CGMS	Coordination of Geostationary Meteorological Satellites
CNES	Centre National d'Etudes Spatiales (the French National Space Agency)
COE	U.S. Army Corps of Engineers
CSF	Control and Simulation Facility (part of Landsat ground system)
CSRS	Civil Space Remote Sensing
DACS	Data Acquisition & Control Subsystem
DAS	Data Base Administration Subsystem
DCLS	Data Collection Platform Location System (ARGOS)
DCP	Data Collection Platform
DCS	Data Collection System
DIF	Domsat Interface Facility
DMSP	Defense Meteorological Satellite Program
DOC	Department of Commerce
DOD	Department of Defense
DDS	Domsat Domestic Satellite
DOI	Department of the Interior
DPSS	Data Processing and Services Subsystem
DRRTS	Data Receive, Record and Transmit Subsystem
DSB	Direct Sounder Broadcast
DUS	Data Utilization System
EDC	EROS Data Center
EDIPS	EROS Digital Image Processing System
ELV	Expendable Launch Vehicle
ERBE	Earth Radiation Budget Experiment
ERL	Environmental Research Laboratories
EROS	Earth Resources Observation System
ERS	ESA Remote Sensing Satellite
ESA	European Space Agency
FAA	Federal Aviation Administration
FAS	Frequency Assignment Subcommittee
FB4	Federal Building 4, Suitland, MD.

FCC	Federal Communications Commission
FMS	Flight Management Subsystem
FNOC	Fleet Numerical Oceanographic Center
FOS	Flight Operations Software Subsystem
FSS	Flight Scheduling Software Subsystem
GAC	Global Averaged Coverage
GARP	Global Atmospheric Research Program
GFIT	Goddard Film Inventory Tape
GHIT	Goddard HDT Inventory Tape
GMS	1. Ground Management Subsystem 2. Geostationary Meteorological Satellite (Japanese)
GMT	Greenwich Mean Time
GOES	Geostationary Operational Environmental Satellite
GPS	Global Positioning Systems
GRS	Ground Receiving Station
GSFC	Goddard Space Flight Center (part of NASA)
GSTDN	Ground Spacelight Tracking and Data Network Stations
GTDS	Goddard Trajectory Determination System
GTS	Global Telecommunications System (of the WMO)
HEPAD	High Energy Proton and Alpha Detector
HIRS-2	High Resolution Infrared Sounder (Version II)
HRPT	High Resolution Picture Transmission
IGF	Image Generation Facility (part of Landsat ground system)
INORAC	Inquiry, Order, and Accounting
JPL	Jet Propulsion Laboratory, Pasadena, CA
LAC	Local Area Coverage
LANDSAT	U. S. Earth Remote Sensing Satellite
LFC	Large Format Camera
LFM	Limited Area Fine Mesh numerical weather forecast model
MEPED	Medium Energy Proton and Electron Detector
MERES	Mineral, Energy, and Resources Exploration Satellite (the Japanese Landsat)
METEOSAT	Meteorological Satellite (European geostationary)
METSAT	Meteorological Satellite (generic)
MIF	Main Image File
MIPS	MSS Image Processing System
MLA	Multispectral Linear Array
MMF	Mission Management Facility (part of Landsat ground system)
MOMS	Modular Optoelectronic Multispectral Scanner
MOS-1	Marine Observation Satellite (Japanese)
MRSE	Microwave Remote Sensing Experiment
MSS	Multi-Spectral Scanner
MSU	Microwave Sounding Unit
NASA	National Aeronautics and Space Administration
NASCOM	NASA Communications System
NBS	National Bureau of Standards
NCCISS	Network Control Center Interface Software Subsystem
NCIC	National Cartographic Information Center
NESDIS	National Environmental Satellite, Data, and Information Service
NESS	National Environmental Satellite Service (now part of NESDIS)
NHC	National Hurricane Center (part of NWS)

NIMBUS	Series of experimental NASA satellites
NMC	National Meteorological Center (part of NWS)
NOAA	1. National Oceanic and Atmospheric Administration 2. The Polar-Orbiting Meteorological Satellites
NOMSS	National Operational Meteorological Satellite System
NOS	National Ocean Survey
NSF	National Science Foundation
NSSFC	National Severe Storms Forecast Center (part of NWS)
NTIA	National Telecommunications and Information Administration
NWS	National Weather Service
OBC	On-Board Computer
OCI	Ocean Color Imager
O&M	Operation & Maintainence
OMB	Federal Office of Management and Budget
PCS	Payload Correction Subsystem
PDP	Program Development Plan
PDR	Problem/Deficit Report
PES	Performance Evaluation Software Subsystem
RSAT	Radarsat
RFP	Request for Proposal
RSS	Request Support Subsystem
SAR	Search and Rescue
SARSAT	Search and Rescue Satellite Assisted Tracking
SBUV	Solar Backscatter Ultra Violet
SDSD	Satellite Data Services Division (part of NESDIS)
SEASAT	A NASA Experimental Oceanographic Satellite
SEB	Source Evaluation Board
SEM	Space Environment Monitor
SLC-3	Space Launch Complex 3
SOCC	Satellite Operations Control Center
SMS	Synchronous Meteorological Satellite
SPOT	Systeme Probatoire d'Observation de la Terre (French Landsat System)
SSEC	Space Science and Engineering Center
SST	Sea Surface Temperture
SSU	1. Stratospheric Sounding Unit 2. Satellite Services Unit
STIP	Stored TIP
STDN	Satellite Tracking and Data Network
STS	Space Transportation System
TBM	Terra Bit Memory
TDRSS	Tracking and Data Relay Satellite System
TDPS	Tracking and Data Positioning System
TED	Total Energy Detector
TIP	TIROS Information Processor
TIPS	TM Image Processing Sybsystem
TIROS	Television Infrared Observation Satellite
TGS	Transportable Ground Station (for Landsat)
TOVS	TIROS Operational Vertical Sounder
TM	Thematic Mapper
TSS	Test and Simulation Software Subsystem

UHF	Ultra High Frequency
UK	United Kingdom
USDA	United States Department of Agriculture
USG	United States Government
USGS	U.S. Geological Survey
VAS	VISSR Atmospheric Sounder
VDB	VISSR Data Base
VISSR	Visible and Infrared Spin Scan Radiometer
VIRGS	VISSR Interactive Gridding System
WEFAX	Weather Facsimile
WMO	World Meteorological Organization
WRS	Worldwide Reference System
WSFO	Weather Service Forecast Offices (of NWS)
WTR	Western Test Range
WWB	World Weather Building, Camp Springs, MD.

APPENDIX A

National Security Requirements

Appendix A to the Solicitation requesting proposals for transfer of United States Civil Operational Remote Sensing Satellites is classified SECRET. Distribution of Appendix A will be handled separately through normal security channels.

APPENDIX B

The Federal Government's R & D Program

Contents

Declassified in Part - Sanitized Copy Approved for Release 2011/11/07 : CIA-RDP05T02051R000200380019-8

B.1 INTRODUCTION

In the Presidential Decision memorandum signed by the President in March 1983 the subject of Federally funded research and development in remote sensing was explicitly addressed, to wit:

> "Any action taken to transfer Civil Space Remote Sensing to the private sector should in no way preclude the continuation of our R&D in NASA and DOD to advance remote sensing technology."

The contract envisaged as the result of this solicitation does not require research and development. However, the research and development program of the Federal Government has always been an important adjunct to the operational systems and the operational systems have provided both data and opportunities for flight for research purposes. This Source Evaluation Board has tacitly assumed that some such relationships will continue after the management of the operational remote sensing system has transferred to the private sector. The Board, therefore, feels that it is important for the prospective bidder to be aware of the projected research program of the Federal Government. This Appendix gives an overview of that projected program in its broadest outlines.

The sections that follow are abstracted from approved agency planning documents and/or projections from budget documents. They, therefore, represent the closest things available to an approved R & D program. They are of course, subject to change in each year's planning and budgetary cycle. They do provide appropriate insight to the present directions and scope of that Federal R & D effort.

In Section VII.A entitled "Systems Improvements" a general statement is made as to the type of R & D to be expected from the Government and the type of R & D that we would anticipate a winning bidder might do. This Appendix delineates the research to be expected on a government side of that line. The programs herein make implicit assumptions about the continuation of the operational program including both the use of data from that program and opportunities for flight provided by the satellite systems.

B.2 POLICY STATEMENTS

The Government and its agencies have a number of policies regarding R&D, many of which appear in the RFP in appropriate places. Relevant policies are collected herein for reference.

Issue: Maintenance of U.S Remote Sensing Technology Lead

NASA R & D should continue with a strong program.

Maintaining the U.S. technological lead in remote sensing is directly related to the ability of U.S. remote sensing hardware/software/value-added enterprises to retain their preeminence in commercial markets. Should the U.S. fall behind in remote sensing technology, U.S. industry will likely suffer the consequences, particularly in overseas markets. Therefore, the U.S. should not defacto give up its technological lead as it did when communications satellites were commercialized.

Having pioneered the development of remote sensing technology, it is vitally important that the U.S maintain its technological lead in this area given the likely emergence of competitive foreign programs at a time when the shape of future U.S. remote sensing activity may still be unclear. The French SPOT satellite system (SPOT-1 projected for launch in early 1985), the Japanese MOS-1 mission (planned for 1986), ESA's ERS-1 mission (1988), the Canadian RADARSAT mission (1990), and the German-developed Modular Optoelectronic Multispectral Scanner (MOMS) instrument June 1983 experimental flight on the Space Shuttle with follow-up refinement will complement current U.S. state-of-the-art technology but in some cases will also demonstrate future generation sensor technology (such as the multilinear array concept) as yet untested in U.S. experimental missions.

Issue Dissemination of NASA R&D Results (non-hardware, e.g., models, analysis, techniques).

It is NASA policy to report the results of NASA-sponsored research activities in an expeditious fashion. Meetings of NASA-sponsored investigators are considered to be open forums for scientific debate and discussion, and any interested investigators may attend. Policies related to the publication and presentation of NASA research results would not be affected by commercialization. There will be no change to the current procedures such as publication in the literature and open seminars.

All NASA research results are considered to be public property and they reside within the public domain. The commercial operator may have a vested interest in remaining abreast of current NASA-sponsored research. The commercial operator will not be provided with early or proprietary access to NASA's research results. There will be no exclusive arrangement/early involvement with the commercial operator.

Issue Prioritization Process for Development of Future R&D Instruments

Insofar as it is still the Government's role to provide for the safety and welfare of its citizenry and to conduct high-risk research and development aimed at advancing the state of science and technology development, the prioritization of future R&D instruments should be strictly a Governmental function where the emphasis is on the general welfare and scientific objectives, and not on potential profitability. A case in point is the satellite-borne Search and Rescue system whch has been tremendously successful in saving lives (over 80 to date), but which has no immediate profit potential other than reducing the expensive search times of Government-provided rescue operations. Other than ensuring that any new instrumentation flown would be done on a non-interference basis with the primary spacecraft mission, the commercial operator should have no direct role in the prioritization.

A private operator does not determine the U.S. Government's (NASA's) R&D prioritization. However, all sources of future and potential operational requirements should be solicited for the Government's prioritization process. Market research by the private sector could provide the Government with information necessary to make a more cost-effective decision. Thus, a private operator could have an indirect role.

Issue Policy Definition with Regard to Data Availability and NASA's R&D/Advanced Technology Shuttle Imaging Radar (SIR), Imaging Spectrometer, Experimentation Flights.

(A) These R&D data will be openly available to the public at incremental cost.

NASA conducts a wide variety of space-based experiments to evaluate the utility of remote sensing techniques for basic and applied studies of the Earth. Experimental sensors placed on orbiting spacecraft can be used to collect remote sensing data in many different parts of the world. Wide dissemination of this data within the global research community is essential to evaluate its utility fully. Past experience with sensors such as the Shuttle Imaging Radar-A has shown that NASA derives significant benefits from research conducted by both domestic and foreign investigators that are not funded directly by NASA. Limitations on the availability of such data would restrict the scope and extent of non-NASA research, which, in turn, would reduce the Government's overall return on its investment in specific orbital experiments. It is in the interest of the U.S. Government in general, and NASA in particular, that remote sensing data collected for R&D purposes be openly available to the public at incremental cost.

(B) R&D Data will not be Restricted to Investigations being Funded by or having Formal Agreements with NASA or Other Government Agencies.

As indicated above, the U.S. Government achieves a significant "multiple effect" on the return on its research investment by permitting experimental data to be widely disseminated. Restrictions on the flow of R&D data into the research community would reduce or diminish the overall R&D achievements of specific flight projects. The flow of such data into the worldwide research community plays an important role in expanding current awareness of the utility of space techniques. This expanded awareness is essential in establishing a viable commercial market for such data over the longer term.

(C) R&D Data will not be Sold Exclusively to the Commercial Operator.

NASA builds experimental sensor systems to address its own programmatic goals and long-range research objectives. These systems are paid for with public dollars, and they are the property of the U.S. Government. The data generated by such sensors are in the public domain. Any U.S. taxpayer can gain access to this data under the auspicies of the Freedom of Information Act. The Government may contract with a commercial entity to archive and distribute R&D data, but it cannot grant proprietary rights to R&D data to a private company.

Issue Flights of R&D Instruments on operational Commercial Spacecraft.

The government would like to continue the present arrangements in some form.

One of the lessons learned from the commercialization of the communications satellites is that U.S. leadership in a particular area is quickly lost in the absence of a continuing program of advanced technology development. No single firm can be expected to have either the financial capability or the profit incentive for such a program. Insofar as continued U.S. leadership in land satellite technology is at stake, the NASA role in advanced technology development should be continued and expanded. Whether the future satellites are provided by the private or government sector, an excess capability would be desirable in terms of space, power, weight, and data-handling capacity, to be used for R&D test flights.

Inherent in the flight of opportunity (or piggyback) concept is the restriction that the experimental, or add-on, instrument must be capable of being flown and operated on a non-interference basis with the original mission objectives. Under the Operational Satellite Improvement Program (OSIP), a number of experimental instruments with the potential of eventually becoming part of the operational complement have been developed by NASA for flight on NOAA operational spacecraft. NASA intends to continue the current piggybacking arrangement. If the land satellites are commercialized, the provision of excess capability (beyond that needed to achieve the original mission) for use in NASA advanced technology development could be part of the basic transfer agreement.

Issue The International Dimension of NASA R&D Use of U.S. Commercialized Data.

Ongoing and planned NASA R&D efforts will require the use of data from R&D and operational instruments by NASA-sponsored investigators, both domestic and foreign. These investigators have been/will be selected through NASA's Announcement of Opportunity process. NASA R&D programs, because they are global in scope, often benefit substantially from the participation of foreign investigators and/or the provision of foreign ground truth data. In the past, foreign scientists have participated in NASA's Landsat 1 and 2, Skylab, Nimbus-7, Heat Capacity Mapping Mission, Magsat and Shuttle Imaging Radar-A investigations; they continue to participate in Landsat-4 Image Data Quality and Shuttle Imaging Radar-B investigations. It can further be anticipated that NASA's evolving Global Habitability/Earth Sciences research program will require data from U.S. meteorological and land operational satellites, both for NASA scientific use (including support of future earth science-related Announcements of Opportunity) and for purposes of exchange for foreign ground truth support and/or foreign satellite data required for NASA R&D.

Like domestic investigators, foreign investigators associated with a NASA R&D effort receive the data they need from NASA at no cost. (Unlike U.S. investigators, NASA does not support foreign investigators; rather, their activities are endorsed by foreign counterpart agencies who agree to bear all other costs associated with the investigation.) In addition to bringing demonstrated expertise to the NASA investigation and engaging in activities of specific interest to NASA, NASA-selected foreign investigators can provide valuable ground truth support and often resources of great potential value to

the NASA R&D program (e.g., foreign instruments/components as with Nimbus and Tiros, or backup data reception support as with Landsat). At the same time, allowing foreign investigators to participate in NASA R&D programs has required and will continue to require an exchange of U.S. remote sensing data (experimental and/or operational) in return for ground truth support or eventually for data from foreign satellite missions. NASA anticipates future research requiremnts for access to ESA ERS-1 data, Canadian RADARSAT data, and Japanese MOS-1 data.

Issue NASA R&D Requirement for Foreign Remote Sensing Data

A number of foreign nations/agencies (France, Japan, European Space Agency, Canada, India, Federal Republic of Germany, Brazil) are currently developing or plan to develop either remote sensing instruments for spaceflight or full-scale remote sensing missions. NASA research scientists have already made plans to obtain data from the German-developed Modular Optoelectronic Multispectral Scanner (MOMS) instrument scheduled for a June 1983 Shuttle experimental flight and the Microwave Remote Sensing Experiment (MRSE) instrument scheduled for flight on Spacelab 1 in September 1983. Likewise, NASA anticipates future research requirements for access to European Space Agency ERS-1 data (in particular, ERS-1 SAR data) in the 1988 timeframe, Japanese MOS-1 data in the 1986 timeframe, and Canadian RADARSAT data in the early 1990's. Although NASA has not yet identified specific research requirements for French SPOT data, it is likely that NASA scientists will have access to this data in the same manner as will other U.S. users -- through purchase of the data. In the other above-cited instances, it is likely that NASA will obtain foreign satellite data for its experimental purposes through cooprative agreement in exchange for U.S. data, in support of U.S. investigators, or in return for U.S. ground truth support.

NASA may explore the possibility of direct readout of foreign remote sensing satellite data by U.S. ground stations for experiment purposes. Such arrangements could be patterned after similar arrangements whereby U.S. experimental satellite data was acquired by direct readout at foreign ground stations on the basis of negotiated agreements.

B.3 NASA'S EARTH SCIENCE AND APPLICATIONS RESEARCH PROGRAM

Introduction

The physical characteristics of the Earth are the result of the interaction between many processes. The absorption of solar radiation and the subsequent transfer of the energy and momentum within the Earth's atmosphere and global oceans produce the terrestrial climate in which we live. The convective flow in the Earth's interior, manifested by slow but unrelenting motions of large masses of the Earth's surface, reshape the Earth continually. The same fluid motions produce a magnetic field in the dense metallic core which shields the Earth's surface from the solar wind streaming outward from the sun. The balance of physical and chemical processes on the Earth's surface and the near space environment provide the conditions to which living organisms on the land, in the oceans, and in the air owe their continued survival.

The study of earth sciences can be considered to have begun when man first recorded the phenomena which occurred around him. The divison of the earth sciences into disciplinary areas, such as atmosheric physics, oceanography, geology, and biology, developed because of the necessity to delineate problems that were tractable. However, as the boundaries of each of these disciplines has grown so has the overlap between the traditional disciplinary areas. At the same time the view of the Earth from space has engendered a growing awareness of the Earth as a planet and the realization that a full understanding of earth science processes must involve a strong global interdisciplinary research program. The study of the processes which govern the solid earth, its oceans and atmospheres, and its life forms require coordinated global observations and theories that integrate these observations.

It has been speculated that man now has the ability to effect the environment of the globe as a whole and not just simply his immediate environment. Examples of global issues consist of: (1) the release of carbon dioxide into the atmosphere from the burning of fossil fuels; (2) the release of chlorofluoromethanes and their subsequent impact on stratospheric ozone; (3) deforestation and its impact on weather and climate; and (4) acid rain.

Predictions of the impact of man-made changes on the environment of the globe can differ widely depending on the choice of data and the disciplinary approach that is used. These differences arise because scientists most frequently think of environmental issues from a single disciplinary point of view; that is, as atmosphere only, or land only, or ocean only. In reality, however, a single discipline perspecitve is no longer a valid approach to predictions of man-made changes. Changes on Earth which are of concern to mankind in the next decade or so involve cycling of energy, water and essential chemicals through the atmosphere, land, biosphere, and the oceans. The issues to be addressed, therefore, involve interactive, interdisciplinary processes and any one process studied in isolation can give only partial and sometimes deceptive answers. What is needed is an interdisciplinary research program whose goal is to provide information based on sound scientific principles whch can be used by the policy maker to make cost-effective decisions.

In the past decade, NASA has developed many remote sensing techniques that can provide the data necessary for such an interdisciplinary earth sciences program. At the same time, our ability to model some of the complex processes, aided by the rapid improvement in computers, has reached the point of practicality on a global scale. The time has come, therefore, when a program in the earth sciences coupled with remote sensing technology can be reasonably expected to provide an interdisciplinary understanding of global processes for the first time.

Program Strategy

The Earth Science and Applications Program of the Office of Space Science and Applications is a global, integrated, interdisciplinary program with emphasis on understanding those processes that impact the habitability of the Earth, in particular, biological productivity, and air and water quality. It consists of coordinated observational, theoretical, and experimental investigations and development of future observing technologies. Emphasis is placed upon the

physical processes that give rise to observed phenomena and thereby the cause and effect relationships that characterize the problems under investigation are revealed. Only by this means can realisitic predictive models be developed. The observational investigations typically require collection of data simultaneously and sometimes from several locations in the solar-terrestrial system. They involve a variety of instruments making both remote and in situ measurements. Some investigations involve controlled perturbations of the space plasma and the atmosphere, using space as a laboratory. The observational experimental and theoretical programs are complementary and together represent a balanced program of system and process studies. Data from both the advanced remote sensing technologies as well as the operational Metsat and Landsat systems are essential contributions to such studies.

Current and Near-Term Programs

- Land and Geodynamics

  In the area of Geodynamics, research and development activities are being conducted to better understand the solid Earth including crustal processes, internal structure and composition, rotational dynamics, and geopotential fields. Accurate knowledge of the Earth's gravity and magnetic fields is essential to earth science studies particularly those involving the solid Earth and oceans and to studies of energy and mineral resources. Currently the gravity fields are known to an accuracy of 5-8 milligal for resolutions of 500-800 km, and the geoid (mean ocean sea level) to about 50 cm. The magnetic field changes so significantly over a period of 3 to 5 years that the accumulative eror renders all models obsolete. The Geopotential Research Mission, now being planned by NASA, will provide the most accurate global gravity field and geoid models yet available. The resolution would be greatly improved over that presently available, and important geological structures now barely detectable in the magnetic gravity field data would be revealed in enough detail to permit comprehensive modeling.

  In Land Processing, increasing emphasis is being placed on understanding the structure and processes of the biosphere as these are particularly influenced by land surfaces. The program emphasizes the spatial aspects of biospheric dynamics of both anthropogenic and natural origins, with a focus on the biogeochemical cycles, hydrology, and energy exchange at the land-air interface, land-water interface, and land surface changes as those influence biological productivity.

Landsat-4, an improved spaceborne land observing system, was launched on July 16, 1982, and provides a major data source for land processes studies. The instrument complement includes the MSS to provide data continuity with the previous Landsats and a new sensor, the Thematic Mapper (TM). The TM has 7 spectral bands with an extended spectral range, improved spectral resolution, and higher radiometric accuracy and resolution.

Two major instruments are scheduled for flight on the Shuttle in July 1984 as part of the OSTA-3 complement -- the Large Format Camera (LFC) and the Shuttle Imaging Radar-B (SIR-B). The LFC is a high-resolution photogrammatic camera with a 23 x 46 cm. format and a resolving power of 15 cm. for high contrast objects from Shuttle altitudes. SIR-B is an upgraded version of the L-band synthetic aperture radar (SIR-A) flown on the second space shuttle mission in 1981. SIR-B will have a resolution of approximately 40 m. at an incidence angle of 45^{o}. In addition, an antenna tilt mechanism will vary the incidence angle from 15^{o} to 65^{o}. An analysis of Seasat synthetic aperture radar data and SIR-A data indicate that no single incidence angle for SAR imagery is optimal for all geological terrains and that the incidence angle may be "tuned" to the local topography. The primary objective of the SIR-B mission is to understand radar imaging of the earth as a function of illumination geometry.

The Free-Flying Imaging Radar Experiment (FIREX) is a multiparameter radar imaging system for use in both land and oceanic scientific research where seasonal or long-term data is needed. FIREX would build on the heritage of SIR-A, SIR-B, and SAMEX. Potential additional instruments include a wind-wave scatterometer, multiband radiometers, and a multiband optical imager. The FIREX orbit would provide 3-day repeat coverage.

The data from the described radar missions will be used to exploit the microwave spectrum for scientific research in remote sensing of the earth on a planetary basis. In radar, the ability to control the parameters of incidence angle, frequency, and polarization provides valuable additional information not obtainable from single-parameter SAR imagery. This is because radar backscattered waves are very sensitive to landform geometry and different geometrical features are emphasized by the proper

choice of illumination geometry, wavelength and polarization. For this reason, NASA radar research emphasizes the role of frequency, incidence angle, and polarization on the signatures of geological landforms, vegetation communities, and soil.

While the capabilities of TM will represent a significant improvement in our remote sensing capabilities from space, there is a developing need for even higher spectral and spatial resolution in future systems. The technology widely regarded as the best approach for future systems is the pushbroom mode sensor utilizing solid state arrays. NASA's major effort in this rapidly evolving technology is the Multispectral Linear Array (MLA) program. Under this program, technology and instrument developments are in progress with the goal of not only developing the enabling technology base for a potential successor to the TM but also to develop a basic research instrument for future Shuttle and free flier observation of the Earth's surface cover and topography. The near-term technology emphasis is on the development of an all solid state MLA sensor incorporating a new generation of detector materials, visible and shortwave infrared (SWIR) multispectral linear focal plane arrays, on-board signal processing, and advanced ground data processing concepts.

The future MLA sensor system will provide significant improvements in spatial, spectral and temporal resolutions. While there is a demonstrated need for this capability, considerable research needs to be done to assess the utility of these parameters as well as the trade-offs among them. To address these issues, a number of supportive research projects are being conducted at both GSFC and JPL. These include studies of the texture and structural feature effects at high resolution, atmospheric and terrain relief distortions associated with off nadir viewing and multispectral image correlation principle component data compression techniques. A study is also in progress to determine the sensor measurement accuracies needed to generate data that meets future mapping accuracy standards at 1:25,000 scale.

A Global Biology program is being developed to deal with the influences of biological processes on global biogeochemical cycles. Biological processes dominate in the production and removal of many constituents of the biosphere, and understanding these processes is critical to understanding the consequences of environmental perturbations. The key areas to be investigated are:

(a) Land use areal extent, biomass, and rates of change as determined from remote sensing data;

(b) Biogenic gas fluxes and the factors that affect them;

(c) Monitoring ecological processes in situ; and

(d) Interpretation of the sedimentary fossil record to test hypotheses about modern processes.

o Oceans *

In the area of Oceanic processes, research projects are conducted to develop a solid scientific basis for viewing and understanding the ocean from space. The scientific requirements for viewing the oceans from space fall into three general areas: (1) studying the circulation (both geostrophic and wind-driven) and heat content of the oceans, and how they are influenced by the atmosphre; (2) studying the primary productivity of the oceans and how it is influenced by the physical/chemical environment and higher elements in the marine food chain; and (3) studying the growth and movement of sea ice and how it is influenced by the atmosphere and ocean.

NASA is developing objective techniques for the removal of the directional ambiquity associated with scatterometer winds (and surface stress), as well as conducting quantitative studies with the Global Weather Program to assess the impact of scatterometer winds on atmospheric forecasts. NASA is working on selected in-situ sensors for the determination of ocean currents; data from such sensors are required both to evaluate the potential of spaceborne observations of surface currents, as well as to provide complementary subsurface currents. NASA is investigating the capabilities and limitations of spaceborne observations of chlorophyll concentration to estimate phytoplankton productivity; and is also looking at in-situ techniques for the measurement of defining the full potential of the SMMR aboard Nimbus 7 and Seasat for unambiquously resolving the relative contributions made by first-year and multi-year components to sea ice concentration images; and establishing procedures to utilize successive SAR images to quantify the movement and deformation of the sea ice field.

* Note: This information provided because of the interactive nature of NASA's land, ocean and atmospheric remote sensing program.

An ocean Topography Experiment (TOPEX) is being proposed that would provide a capability to globally observe the ocean such that a vastly improved understanding of the ocean's circulation can be obtained. More specifically, the primary goal of TOPEX is to measure the surface topography of the ocean over entire ocean basins for several years, to integrate these measurements with subsurface measurements and models of the ocean's density field in order to determine the general circulation of the ocean and its variability. This information will be used to understand the nature of dynamics, to calculate the heat transported by the oceans, the interaction of currents with waves, and to test the ability to predict circulation.

Given the success of the Coastal Zone Color Scanner (CZCS) that flew on Nimbus in 1978, it has become clear that a follow-on is required to address the determination of global primary productivity, which forms the base for the various marine food chains. The synoptic, global perspective of a satellite color scanner which measures ocean chlorophyll concentration will provide the prime data base to which complementary ship, airplane, and buoy data can be added to improve the accuracy of primary productivity estimates for key oceanic regions.

- Atmospheres *

NASA is specially equipped with experience and facilities to deal with the special problems of understanding the circulation of the atmosphere. This capability includes processing the enormous quantities of data involved and providing interpretations of the results in meteorological issues. The investigation and assessment of the FGGE (First GARP Global Experiment) data set is proceeding. An effort is underway to develop and fly an Advanced temperature and Moisture Sounder Unit (AMSU). Studies indicate that the performance expected of such a sensor could approach that of the radiosonde, but with far more complete spatial coverage.

In the area of severe storms and local weather, research emphasis is on the use of remote meteorological observations from space or high-flying aircraft and the consolidation of multiple data sources using high-technology interactive computer techniques for data assimilation and

* Note: This information provided because of the interactive nature of NASA's land, ocean, and atmospheric remote sensing program.

analysis. New measurement techniques are under development utilizing research flights of the CV-990 with the Doppler Lidar Wind Velocimeter, the ER-2 for cloud-top physics observations, stereo cloud growth, and ice/water phase meaurements and the U-2 for spectral and spatial characterization of lighting. Heavy emphasis is being placed upon developing research applications of the Visible-Infrared Spin-Scan Radiometer Atmospheric Sounder on GOES satellites. New algorithms are under development to infer temperature, moisture and winds at different heights in the atmosphere.

The measurement of winds in the troposhere on a global scale is essential to the verification and improvement of Global Circulation Models of the atmosphere. At present, wind measurements are limited to ground based stations and to observations of cloud motions from synchronous altitudes. A new concept is being designed to measure wind profiles in the troposphere from the surface to about 15 km altitude using the Doppler shift of a pulse CO_2 lidar signal backscattered from tropospheric aerosols.

Observations from the Nimbus 6 and 7 Earth Radiation Budget (ERB) instruments and future operational NOAA satellites are being used as a foundation for developing a continuing series of Earth radiation budget data sets. The data sets formed from these observations will serve as a continuing resource for climate research. These data sets will be continued and augmented by the launch of the Earth Radiation Budget Experiment (ERBE) scheduled for 1984.

Recent evidence from the Nimbus-7 and SMM satellite observations confirm natural variations in the total solar output of several tenths of a percent for periods of up to about two weeks. To determine the impact of such variations on the climate systems as well as to monitor their long-term trend, several instruments have been designed for Shuttle operations: Active Cavity Radiometer (ACR) , Solar Ultraviolet Spectral Irradiance Monitor (SUSIM), and Solar Constant Variations (SCV). Research programs have been developed to understand the model cloud formation and cloud interaction with incident or reflected radiation, and to study sources, compositions, and radiative impact of injection of aerosols to the stratosphere by volcanic explosions. In addition, development of a global cloud climatology data set is anticipated from the International Satellite Cloud Climatology Project (ISCCP).

Investigations aimed at developing techniques for measurements of major trace species in the troposhere are in progress. Field measurements are being undertaken to test the most promising instrumental techniques, both independently and in groups for intercalibration and/or to make measursements of chemically related species. We are planning to follow this study with an intensive, integrated six-year aircraft measursement program to characterize the chemistry of the troposphere on a global scale.

Research on the upper atmosphere (the stratosphere and mesosphere) continues. In the last few years, the use of more realistic two- and three-dimensional models has increased. NASA is continuing to improve the chemical,radiative, and dynamic computer codes used in these models with the goal of having fully coupled radiative, chemical, and dynamical three-dimensional models which truly simulate the atmosphere. NASA is conducting a series of balloon, rocket, and aircraft measurements utilizing a number of different instrumental techniques to measure trace species in the stratosphere. These measurements will also provide an absolute intercomparison of currently existing experimental techniques.

Data from Nimbus 4, Nimbus 6, Nimbus 7 and the Stratospheric Aerosol and Gas Experiment (SAGE) have been validated and are now becoming available for detailed analysis. Results from the Solar Mesosphere Explorer (SME) for ozone, nitric oxide and water vapor will soon be availabel for analysis. In addition to these satellite missions, three instruments have been developed for Space Shuttle Flights. These are the Atmospheric Trace Molecule Spectroscopy (ATMOS) experiment, which measures stratospheric trace species; the Imaging Spectrometer Observatory (ISO), which measures mesospheric trace species; and the Solar Ultraviolet Spectral Irradiance Monitor (SUSIM).

A new satellite program, the Upper Atmosphere Research Satellite Program (UARS), will provide an extension of the understanding of the chemical and physical processes occurring in the earth's stratosphere, mesosphere, and lower thermosphere. The UARS mission will utilize remote sensing instruments to measure trace molecular species, temperature, winds, radiative energy input/losses to the upper atmosphere, and where appropriate, in-situ measurements to determine magnetospheric energy inputs to the upper atmosphere. A high degree of

interaction among experimental and theoretical investigations is anticipated and an interactive central data facility with direct on-line investigatior access via remote terminals will be provided as akey element of the program.

Future Long-Term Thrusts

One of the future thrusts of the Earth Science and Applicatiions program in the next decade will be to investigate the long-term physical, chemical and biological trends and changes in the Earth's environment, including its atmosphere, land masses, and oceans. The program will specifically investigate the effects of natural and human activities on the Earth's environment by measuring and modeling important nutrient chemical cycles, and will provide realistic models to estimate the future effects on biological productivity and habitability of the earth by man and other species. This program will involve space and suborbital observation, land- and sea-based measurements, laboratory research, and supporting data management technologies over a ten year or longer period of time. This thrust will complement the current programs directed toward advancing remote sensing science and applying remote sensing techniques in discipline studies such as hydrology and geology.

The future space measurements to support this program must also be interdisciplinary. The interdisciplinary approach will benefit from large space platforms capable of supporting a variety of multispectral remote sensing instruments. Such concepts are now under study by NASA's Office of Space Science and Applications.

NASA's Flight Program

In support of the scientific and applications programs described above, NASA plans and carries out a number of flight missions. Those approved or well along in planning are described briefly in the following pages. Furthermore, a number of instruments are under development which are or could be candidates for flight on some mission (e.g., a commercial spacecraft) in the future. These are listed with their goals and status below. Although not all of the program are directly associated with land remote sensing, this information is provided because of the recognized interdisciplinary ties described in paragraph B.3.

EARTH SCIENCE AND APPLICATIONS

EARTH RADIATION BUDGET SATELLITE EXPERIMENT (ERBE)

MISSION OBJECTIVES THREE SATELLITE SYSTEMS TO COLLECT DATA FOR IMPROVED UNDERSTANDING OF CLIMATE PROCESSES BY DETERMINING EARTH'S RADIATION BUDGET AND DISTRIBUTION OF RELATED AEROSOLS AND GASES

SENSORS	ERBS	NOAA F&G	
	SCANNING RADIOMETER		NOAA SENSORS
	NON-SCANNING RADIOMETER		ERBE SOLAR RADIATION
	MULTISPECTRAL RADIOMETER		

RECOMMENDED BY NATIONAL ACADEMY OF SCIENCE

FLIGHT PARAMETERS	ERBS	NOAA F&G
	600 KM ORBIT	830/870 KM ORBIT
	46^{o} - 57^{o} INCLINATION	90^{o} INCLINATION

STATUS 29 PRINCIPAL INVESTIGATORS (8 INTERNATIONAL)
ERBS-SHUTTLE LAUNCH 3RD QUARTER/1984
NOAA-F ATLAS LAUNCH 3RD QUARTER/1984
NOAA-G ATLAS LAUNCH 1ST QUARTER/1986

EARTH SCIENCE AND APPLICATIONS

ORIGIN OF PLASMAS IN EARTH'S NEIGHBORHOOD (OPEN)

MISSION OBJECTIVES: TO IMPROVE OUR UNDERSTANDING OF PLASMA PROCESSES THAT CONTROL THE COLLECTIVE BEHAVIOR OF GEOSPACE COMPONENTS AND TRACE THEIR CAUSE-AND-EFFECT RELATIONSHIPS THROUGH THE SYSTEM

RECOMMENDED BY: INTERNATIONAL MAGNETOSPHERIC STUDY STEERING COMMITTEE
NATIONAL ACADEMY COMMITTEE ON SOLAR AND SPACE PHYSICS

SENSORS:

- COLD PLASMA ANALYZER
- HOT PLASMA ANALYZER
- CHARGED PARTICLE ANALYZER
- COSMIC RAY ANALYZER
- PLASMA WAVE SENSORS
- GAMMA RAY BURST DETECTOR
- AURORAL IMAGERS
- MAGNETIC FIELD SENSORS
- ELECTRIC FIELD SENSORS

FLIGHT PARAMETERS:

INTERPLANETARY PHYSICS LABORATORY (IPL)	POLAR PLASMA LABORATORY (PPL)	EQUATORIAL MAGNETOSPHERE LABORATORY (EML)	GEOMAGNETIC TAIL LABORATORY (GTL)
NEAR SUNWARD SUN-EARTH GRAVITATIONAL POINT ORBIT	ECCENTRIC, POLAR K-INCLINATION ORBIT	ECCENTRIC EQUATORIAL K-INCLINATION ORBIT	USES LUNAR GRAVITY ASSISTS TO KEEP APOGEE OVER NIGHT HEMISPHERE

STATUS:

- 36 PRINCIPAL INVESTIGATORS SELECTED
- INSTRUMENTS-DEFINITION PHASE
- SPACECRAFT SYSTEMS-PREDEFINITION PHASE
- PROPOSED FY 1987 NEW START

EARTH SCIENCE AND APPLICATIONS

GEOPOTENTIAL RESEARCH MISSION (GRM)

MISSION OBJECTIVES	DETERMINE THE EARTH'S GRAVITY AND MAGNETIC FIELDS TO PROVIDE ACCURATE MATHEMATICAL MODELS FOR STUDIES OF THE SOLID EARTH AND THE OCEANS
RECOMMENDED BY	NATIONAL ACADEMY OF SCIENCE COMMITTEE ON GEODESY (PANEL ON GRAVITY AND SEA LEVEL) NATIONAL ACADEMY OF SCIENCE SPACE SCIENCE BOARD (COMMITTE ON EARTH SCIENCE) GEODYNAMICS PROGRAM REVIEW BOARD (NASA, NOAA, USGS, USSF, DMA)
SENSORS	DISTURBANCE COMPENSATION SYSTEM (DISCOS) SATELLITE-SATELLITE TRACKING SYSTEM VECTOR AND SCALER MAGNETOMETERS
FLIGHT PARAMETERS	160 KM POLAR ORBIT 100-800 KM VARIABLE SATELLITE SEPARATION SHUTTLE LAUNCHED
STATUS	ANNOUNCEMENT OF PLANNING OPPORTUNITY (1984) DATA ANALYSIS ANNOUNCEMENT OF OPPORTUNITY (1986) MODEL INTERPRETATION ANNOUNCEMENT OF OPPORTUNITY (1989) PROPOSED FY 1988 NEW START CY 1992 LAUNCH

EARTH SCIENCE AND APPLICATIONS

UPPER ATMOSPHERIC RESEARCH SATELLITE (UARS)

MISSION OBJECTIVES: TO INVESTIGATE THE ENERGETICS, CHEMICAL COMPOSITON, AND DYNAMICS OF THE EARTH'S STRATOSHPERE AND MESOSPHERE

RECOMMENDED BY: SPACE SCIENCE BOARD
COMMITTEE ON SOLAR TERRESTRIAL RELATIONSHIPS

SENSORS/EXPERIMENTS:

- CRYOGENIC LIMB ARRAY ETALON SPECTROMETER
- PARTICLE ENVIRONMENT MONITOR
- HALOGEN OCCULATION EXPERIMENT
- SOLAR ULTRAVIOLET SPECTRAL IRRADIANCE MONITOR
- IMPROVED STRATOSPHERIC AND MESOSPHERIC ULTRAVIOLET SPECTROMETER
  - SOLAR/STELLAR INTERCOMPARISON EXPERIMENT
  - WIND/TEMPRATURE MEASUREMENT IN THERMOSPHERE AND STRATOSPHERE (FRANCE)
- MICROWAVE LIMB SOUNDER
- HIGH RESOLUTION DOPPLER INTERFEROMETER
- SOLAR BACKSCATTER ULTRAVIOLET MONITOR
- ULTRAVIOLET BACKSCATTER SPECTROMETER
- ACTIVE CAVITY RADIANCE MONITOR

FLIGHT PARAMETERS: 600 KM CIRCULAR ORBIT
65^{o} INCLINATION

STATUS: 19 PRINCIPAL INVESTIGATOR SELECTED
INSTRUMENTS NOW IN EXECUTION PHASE
PHASE B MISSION DEFINITION NEARING COMPLETION
MISSION EXECUTION PROPOSED BY FY 1985 NEW START
SHUTTLE LAUNCH IN 1989

EARTH SCIENCE AND APPLICATIONS

OCEAN TOPOGRAPHY EXPERIMENT (TOPEX)

MISSION OBJECTIVES	IMPROVED UNDERSTANDING OF THE CIRCULATION OF THE GLOBAL OCEAN
RECOMMENDED BY	NATIONAL ACADEMY OF SCIENCES NATIONAL ADVISORY COMMITTEE ON OCEANS AND ATMOSHERE COMMITTEE FOR CLIMATE CHANGE IN THE OCEAN
SENSORS	DUAL CHANNEL ALTIMETER MICROWAVE RADIOMETER ADVANCED DOPPLER TRACKING
FLIGHT PARAMETERS	1300 KM CIRCULAR ORBIT 63^{o} INCLINATION SHUTTLE LAUNCHED
STATUS	PHASE A COMPLETED IN 1981 ANNOUNCEMENT OF OPPORTUNITY-DATE TO BE DETERMINED FISCAL YEAR 1985 PROPOSED NEW START CY 1988 LAUNCH

EARTH SCIENCE AND APPLICATIONS

FLIGHT INSTRUMENT DEVELOPMENT

PAYLOAD	OBJECTIVE	SENSOR(S)	STATUS
LARGE FORMAT CAMERA	HIGH RESOLUTION MAPPING	30.5 CM. FOCAL LENGTH CAMERA	STS-14 LAUNCH IN JUNE 1984, STS-17 LAUNCH IN AUGUST 1984
SHUTTLE IMAGING RADAR-B (SIR-B)	FUNDAMENTAL RESEARCH IN MICROWAVE REMOTE SENSING	L-BAND SAR TILT AND FOLD ANTENNA DIGITAL DATA CONTROLLABLE INCIDENCE ANGLE	STS-17 LAUNCH IN AUGUST 1984
SHUTTLE TETHERED SATELLITE	SPACE PLASMA, ATMOSPHERIC, GRAVITY AND GEOPOTENTIAL MAGNETIC PHENOMENA	MAGNETOMETER SPECTROMETER ION ANALYZERS	APRIL 1987, APRIL 1988 SHUTTLE FLIGHTS
STS MULTISPECTRAL LINEAR ARRAY (MLA) EXPERIMENT	BIOMASS, BI-DIRECTIONAL REFLECTANCE, AND ATMOSPHERIC EFFECTS	OFF NADIR POINTING 6 BAND (4 VISIBLE, 2 SHORTWAVE INFRARED) FOCAL PLANE SENSOR	SHUTTLE PAYLOAD IN CY 1987
SHUTTLE IMAGING SPECTROMETER (SIS)	IMPROVED SPECTRAL DISCRIMINATION OF GEOLOGY, VEGETATION AND SOILS	HI SPECTRAL/SPATIAL RESOLUTION SPECTRO-METER (.4-2.5/UM)	SHUTTLE PAYLOAD IN CY 1989
SOLAR ULTRAVIOLET SPECTRAL IRRADIANCE MONITOR	IMPROVED SOLAR FAR-ULTRAVIOLET MEASUREMENTS	SCANNING SPECTRO-PHOTOMETER (140-210 NM)	FLOWN ON STS-3 ASSIGNED ON SPACELAB-2 REFLIGHTS ON SOM
GEOPHYSICAL FLUID FLOW EXPERIMENT	SIMULATION/STUDY OF DENSITY AND STRATIFIED	CONCENTRIC, ROTATING ELECTRONICALLY CONDUCTING FLUID-FILLED SPHERES	ASSIGNED ON SPACELAB-3

EARTH SCIENCE AND APPLICATIONS

FLIGHT INSTRUMENT DEVELOPMENT

PAYLOAD	OBJECTIVE	SENSOR(S)	STATUS
MEASUREMENT OF AIR POLLUTION FROM SATELLITES (MAPS)	GLOBAL MEASUREMENT OF TROPOSPHERIC CO	GAS FILTER CORRELATION RADIOMETER	STS-3 PAYLOAD FLIGHT ASSIGNED FOR 3 REFLIGHTS
ACTIVE CAVITY RADIOMETER (ACR-1)	MEASUREMENT OF THE SOLAR CONSTANT	PYROHELIOMETERS RADIOMETER	READY FOR FLIGHT ON SPACELAB-1 WITH REFLIGHTS PLANNED
ATMOSPHERIC TRACE MOLECULE SPECTROSCOPY (ATMOS)	GLOBAL MEASUREMENT OF CHEMICAL COMPOSITION OF STRATOSPHERE	INTERFEROMETER SPECTROMETER	FLIGHT ASSIGNED ON SPACELAB-1 WITH REFLIGHTS
LIGHT INTENSITY DETECTING AND RANGING (LIDAR)	MEASUREMENT OF ATMOSPHRIC H_2O VAPOR, O_3 & AEROSOL	UNDER STUDY	CONCEPTUAL STUDY
OCEAN COLOR IMAGER (OCI)	MEASUREMENT OF OCEAN COLOR, CLOROPHYLL CONCENTRATION, PRIMARY PRODUCTIVITY	2-CHANNEL VISIBLE NEAR INFRARED IMAGER	CONCEPTUAL DESIGN STUDIES COMPLETE
SOLAR BACKSCATTER ULTRAVIOLET (SBUV-2)	GLOBAL OZONE MEASUREMNETS	SPECTROMETER PHOTOMETER	BEING PREPARED FOR FLIGHT NOAA-F
SCATTEROMETER (SCATT)	GLOBAL MEASURMENT OF WIND STRESS AT SEA SURFACE OCEAN DYNAMICS	14.0 GHR RADAR 6 STICK ANTENNA	NAVY POSS. 1988 LAUNCH

EARTH SCIENCE AND APPLICATIONS

FLIGHT INSTRUMENT DEVELOPMENT

INSTRUMENT	OBJECTIVES	STATUS
ATMOSPHERIC EMISSIONS PHOTOMETRIC IMAGER (AEPI)	IMAGING IN ULTRAVIOLET-VISIBLE SPECTRUM WITH LOW LIGHT LEVEL TELEVISION (FILTERED)	SPACELAB-1 MISSION REFLIGHT ON SPACE PLASMA LABORATORY
SPACE EXPERIMENTS WITH PARTICLE ACCELERATOR (SEPAC)	STUDY OF INTERACTION OF BEAMS OF ELECTRONS, IONS, AND NEUTRAL GAS WITH THE IONOSPHERE	SPACELAB-1 MISSION REFLIGHT ON SPACE PLASMA LABORATORY
WAVES IN SPACE PLASMA (WISP)	STUDY OF VLF-HF WAVE PROPOGATION IN THE IONOSPHERE	SPACE PLASMA LABORATORY
PLASMA DIAGNOSTICS PACKAGE (PDP)	MEASUREMENT OF PLASMA PARAMETERS REMOTE FROM SHUTTLE	FLOWN ON STS-3 SPACELAB-2 REFLIGHT SPACE PLASMA LABORATORY PLANNED
RECOVERABLE PLASMA DIAGNOSTICS PACKAGE 9RPDP)	MEASUREMENT OF PLASMA PARAMETER REMOTE FROM SHUTTLE	SPACE PLASMA LABORATORY
THEORETICAL AND EXPERIMENTAL STUDY OF BEAM-PLASMA, PHYSICS (TEBPP)	PASSIVE IONOSPHERIC INTERACTION STUDIES	SPACE PLASMA LABORATORY
ENERGETIC ION MASS SPECTROMETER (EIMS)	MEASURE MASS, CHANGE, AND ENERGY OF ENERGETIC MAGNETOSPHERIC IONS	SPACE PLASMA LABORATORY
IMAGING SPECTROMETER OBSERVATORY/ ENERGETIC NEUTRAL ATOM PRECIPI-TATION (ISO/ENAP)	UV/VIS/IR IMAGING OF ATMOSPHERIC EMISSIONS	IMAGING SPECTRO-PHOTOMETER OBSERVATORY-SPACELAB-1 ENERGETIC NEUTRAL ATOM PRECIPI-TATION-SPACE PLASMA LABORATORY
VECHICLE CHARGING AND POTENTIAL (VCAP)	STUDY OF STS-ORBITER CHARGING CHARACTERISTICS AND PLASMA INTERACTION WITH THE IONOSPHERE	FLOWN ON STS-3 REFLIGHT ON SPACELAB-2

B.5 The Department of Agriculture's Research and Development Program.

In recognition of the potential of aerospace remotely sensed data as source of information, the U.S. Department of Agriculture (USDA) is now engaged in an extensive long-term research program to develop, test, and evaluate aerospace remote sensing in meeting priority information needs.

The Joint Program for Agriculture and Resources Inventory Surveys Through Aerospace Remote Sensing (AgRISTARS) is a cooperative effort of the USDA; the National Aeronautics and Space Administration (NASA); the U.S. Department of Commerce (DOC) through the National Oceanic and Atmospheric Administration (NOAA); and the U.S. Department of the Interior (DOI). In addition, the Agency for International Development (AID) participates as an ex officio observer and future user agency.

The AgRISTARS program was initiated in fiscal year 1980 and will extend through fiscal year 1986. The overall goal of the AgRISTARS program is to determine the feasibility of integrating aerospace remote sensing technology into existing or future USDA information systems. Determining feasibility depends upon the assessment of numerous factors over an extended period of time. Determinations of the reliability, costs, timeliness, objectivity, and adequacy of information required to carry out USDA missions are planned in the program. The overall approach consists of a balanced program of remote sensing research, development, and testing which addresses a wide range of information needs on domestic and global resources and agricultural commodities.

In planning the AgRISTARS program, USDA identified seven priority information requirements:

-- Early warning of change affecting production and quality of commodities and renewable resources.

-- Commodity production forecasts

-- Land use classification and measurement

-- Renewable resources inventory and assessment

-- Land productivity estimates

-- Conservation practices assessment

-- Pollution detection and impact evaluations

In its implementation the program has encompassed activities in all of the requirements, but has focussed on development of techniques and procedures to detect changes in crop conditions and to forecast crop production. The AgrISTARS program is global in coverage; although initial emphasis was given to data from the Landsat series of earth-observing satellites, recent research has taken into consideration data available from U.S. civil weather satellites (e.g. NOAA polar-orbiting satellites).

The principal technical accomplishments of the AgRISTARS program in FY 1982 (the last complete year) illustrate how the wide-ranging research and development activity relates to the priority requirements:

-- A highly automated technique for classifying corn and soybeans was successfully tested over large areas of the U.S. Corn Belt.

-- An automated technique to estimate the area of spring small grains early in the season was successfully tested over the U.S. Northern Great Plains.

-- Thematic Mapper data (simulated) was tested in delineating major forest types.

-- Landsat data was used as an adjunct data source for crop estimation in five states.

-- Vegetation indices indicating plant stress have been developed using data from the meteorological satellite advanced very high resolution radiometer (AVHRR).