GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5- 98156
Raytheon STX Corporation	Task No. 001 JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
James L. Green	630 6-7354		J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Management ~~and Systems Engineering~~ task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-45 (7/71)

GODDARD SPACE FLIGHT [illegible]NTER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-98156
Raytheon STX Corporation	Task No. 002 JON: 630-370-18-70-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
W. D. Worrall	630.1 6-6568		J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

System Engineering Support for the Orbiting Satellites Project

The contractor will provide system engineering support to the Orbiting Satellites Project. This system engineering support will be related to the technical management of satellite orbital operations, data processing and dissemination, project-wide planning and evaluation, acting as liaison between the Orbiting Satellites Project and the data user community, and proposing alternate modes of operation to maximize the scientific returns of the mission while reducing costs. The contractor will also provide system engineering support for ongoing reengineering and automation efforts to reduce mission operations costs.

No hardware will be purchased/leased under this task assignment without the approval of the Contracting Officer.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-48 (7/71)

GODDARD SPACE FLIGHT C TER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon STX Corporation	98156	
	TASK ASSIGNMENT NO. 003	JON: 661-440-08-58-02

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
Neil Gehrels	661 6-6546		J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Astrophysics Mission Support Services task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens

SIGNATURE OF CONTRACTING OFFICE

August 12, 1999

Mary V. Stevens

TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Astrophysics Mission Support Services

The purpose of this task is to provide support and consultation services for the Gamma Ray Observatory (GRO) Project Scientist in areas of data management, analysis, and archiving for GRO and for the HIC experiment on Galileo.

Specific tasks are:

- Attend GRO Users Committee meetings to advise on accessing GRO data.
- Assist with Target of Opportunity decisions by consulting previous archival data.
- Present papers at scientific meetings on the GRO archive.
- Provide consultation on data products from the HIC experiment on Galileo.

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-98156	
Raytheon STX Corporation	Task No. 101	OB JON: 631-212-65-20-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
C. Y. Cheung	631 6-2780	R. L. Pisarski	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

AMASE Development and Advanced Technology Support

This task provides support for the development of the object-oriented database multi-spectral astrophysics data catalog, AMASE (Astrophysics Multi-mission Archive Search Engine), as an interface to NASA's astrophysics data holdings.

See attached sheets for detailed task description.

No hardware will be purchased/leased under this task assignment without the approval of the Contracting Officer.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-48 (7/71)

AMASE Development and Advanced Technology Support

This task provides support for the development of the object-oriented database multi-spectral astrophysics data catalog, AMASE (Astrophysics Multi-mission Archive Search Engine), as an interface to NASA's astrophysics data holdings. This is a collaborative effort with the University of Maryland (UMD) Computer Science Department, and frequent interactions with the UMD counterparts are expected. Task personnel are expected to be cognizant of technological developments that have potential application to solving astrophysics data operations issues. The general goal for this performance period is to develop the AMASE prototype into an astronomical search and discovery engine by expanding the data contents and augmenting the search capabilities. Work includes incorporating astrophysics data from other wavelength bands to complete the electromagnetic spectrum, developing procedures to access remote relational databases, and developing utilities to enable object cross-identification by scientific community.

Specific functions include:

- Provide astronomical expertise to support the derivation of user requirements.
- Develop automated procedure to extract metadata from the data stream of active missions during ingest into the data archive.
- Generate metadata from past mission data sets and ADC catalogs to populate the AMASE database
- Develop user interfaces, including Web tools, expert system utilities, data mining and data visualization modules.
- Support the testing and verification of the database search engine developed by UMD.
- Develop routines that enable the AMASE server to interoperate with other Astrophysics data servers at GSFC and at remote sites.
- Provide computer database management and system administration for both object-oriented and relational databases.
- Support the public demonstration of the AMASE system capabilities for appropriate meetings as directed by the ATR.
- Maintain the public version of the prototype system.

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	98156
	Task No. 102
	JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH / ... / ...L	DIVISION CONCURRENCE
Cynthia Y. Cheung	631 6-2780	R. Pisarski	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of "Astrophysics Data Operations: ADC, Metadata Interface and FITS Support" task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-45 (7/71)

ASTROPHYSICS DATA OPERATIONS: ADC, METADATA INTERFACE AND FITS SUPPORT

This task has three (3) sub-tasks, one to operate the Astronomical Data Center, another to develop multispectral astrophysical metadata interface, and a third to provide FITS data format support.

I. Astronomical Data Center

The Astronomical Data Center (ADC) is a long-term archive and distribution center for important astronomical catalogs. It is the highly-regarded U.S. node in a system of worldwide astronomical data centers. The contractor shall ensure that the ADC continues to acquire a wide variety of the most useful astronomical catalogs, and make these catalogs available in computer-readable form to the research community in a timely fashion. Specifically, the contractor shall:

- Collaborate with the Centre de Donnees Astronomiques de Strasbourg (CDS) and other astronomical data centers to ingest, document, archive, and disseminate astronomical catalogs.
- Develop and maintain a World Wide Web interface to the ADC catalogs that enables expeditious location and delivery of the relevant data to the research community, provide appropriate data browsing capabilities, and links to other Web pages.
- Seek ways to expedite discovery of relevant data, including interactions with other astrophysics data centers, the American Astronomical Society (AAS,) and the editors of astronomical journals.
- Implement techniques designed to automate archiving of ADC catalogs and extraction of data from the catalogs.
- Develop and follow data and documentation submission guidelines, and validate the incoming catalogs and documentation.
- Provide the expertise required to improve the existing documentation to a consistent level.
- Participate in the development of new valued-added data products.
- Report monthly statistics on the number of new catalogs acquired and the number of catalogs requests.
- Provide ADC user support services.
- Produce CD-ROMs containing Selected Astronomical Catalogs.
- Prepare and distribute the ADC Electronic Newsletter, approximately quarterly.
- Demonstrate ADC services at scientific meetings.
- Provide logistical support during meetings of the ADF Science Steering Committee.

II. Multispectral Astrophysics Metadata Interfaces

Access and display of multispectral information from astronomical catalogs and data holdings is needed by SSDOO's customer community to effectively locate and choose appropriate data for their scientific studies. The ADF is responsible for providing flexible, Internet-based access to the ADC's multispectral astronomical catalogs, to mission logs, and to NSSDC's astrophysics data holdings. Tools are needed to sort, edit, download, and do simple analyses and displays of these tabular data. This would also include the ability to prepare such sorted tables for Internet-based queries to other science and archive centers.

The contractor shall:

- Develop Web-based tools to access, sort, edit, and download metadata holdings
- Develop Web-based tools to submit such edited tables to NASA's other data centers for automated queries of their data sets
- Develop Web-based tools to perform simple statistical, correlation, and other analyses of such tables.
- Develop Web-based tools for simple displays and visualizations, such as spatial distribution, time coverages, etc., of such edited tables.
- Cooperate and collaborate in these developments, as appropriate, with other science data and archive centers.

III. Astrophysics Data Format

FITS (Flexible Information Transport System) is the internationally adopted standard for the formats of astrophysical images and data files. The contractor shall assure that the ADF provides logistical support for the various FITS committees. The contractor shall support, propagate, and document FITS and its usage by the ADF, NASA data services, all NASA astrophysics missions, past, present, and future, and in the community in general.

Specifically, the contractor shall:

- Participate in the development of FITS standards through support of and participation in the IAU FITS committee, the NOST FITS technical panel, the AAS Working Group on Astronomical Software, the various discipline and mission working groups, and the FITSBITS exploder and related Web forums.
- Support the NOST in the formal issuance and updates of FITS standards documents.
- Promote, document, and support the use of FITS standards through maintenance of WWW pages containing FITS documents and links to other FITS sites worldwide.
- Promote FITS and the FITS office through displays/presentations at AAS meetings.

- Provide other services to the FITS community as may be requested by the various FITS working groups, within available resources.

TASK ORDER

Goddard Space Flight Center (INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
Raytheon STX Corporation	NAS5-98156	102a
4. JOB ORDER NO./PROJECT:	**5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE):**	**6. DESIGNATED FLIGHT**
633-212-62-10-78	____YES ___X___NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED):

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

See Attached for detailed description of "Astrophysics Data Operations: ADC, Metadata Interface and FITS Support" Task.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

9. PERFORMANCE/MILESTONE SCHEDULE: 12/01/00 - 11/30/01

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE: Cynthia Cheung/631/6-2780

14. BRANCE APPROVAL: R. Pisarski for

15. DIV. CONCURRENCE: J. L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE: R. Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

NOV 30 2000

Mary V. Stevens

CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens

TYPED OR PRINTED NAME

ASTROPHYSICS DATA OPERATIONS: ADC, METADATA INTERFACE AND FITS SUPPORT

This task has three (3) sub-tasks, one to operate the Astronomical Data Center, another to develop multispectral astrophysical metadata interface, and a third to provide FITS data format support.

I. Astronomical Data Center

The Astronomical Data Center (ADC) is a long-term archive and distribution center for important astronomical catalogs. It is the highly-regarded U.S. node in a system of worldwide astronomical data centers. The contractor shall ensure that the ADC continues to acquire a wide variety of the most useful astronomical catalogs, and make these catalogs available in computer-readable form to the research community in a timely fashion. Specifically, the contractor shall:

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- Develop and maintain a World Wide Web interface to the ADC catalogs that enables expeditious location and delivery of the relevant data to the research community, provide appropriate data browsing capabilities, and links to other Web pages.
- Seek ways to expedite discovery of relevant data, including interactions with other astrophysics data centers, the American Astronomical Society (AAS,) and the editors of astronomical journals.
- Implement techniques designed to automate archiving of ADC catalogs and extraction of data from the catalogs.
- Develop and follow data and documentation submission guidelines, and validate the incoming catalogs and documentation.
- Provide the expertise required to improve the existing documentation to a consistent level.
- Participate in the development of new valued-added data products.
- Report monthly statistics on the number of new catalogs acquired and the number of catalogs requests.
- Provide ADC user support services.
- Produce CD-ROMs containing Selected Astronomical Catalogs.
- Prepare and distribute the ADC Electronic Newsletter, approximately quarterly.
- Demonstrate ADC services at scientific meetings.
- Provide logistical support during meetings of the ADF Science Steering Committee.

II. Multispectral Astrophysics Metadata Interfaces

Access and display of multispectral information from astronomical catalogs and data holdings is needed by SSDOO's customer community to effectively locate and choose appropriate data for their scientific studies. The ADF is responsible for providing flexible, Internet-based access to the ADC's multispectral astronomical catalogs, to mission logs, and to NSSDC's astrophysics data holdings. Tools are needed to sort, edit, download, and do simple analyses and displays of these tabular data. This would also include the ability to prepare such sorted tables for Internet-based queries to other science and archive centers.

The contractor shall:

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- Develop Web-based tools to submit such edited tables to NASA's other data centers for automated queries of their data sets
- Develop Web-based tools to perform simple statistical, correlation, and other analyses of such tables.
- Develop Web-based tools for simple displays and visualizations, such as spatial distribution, time coverages, etc., of such edited tables.
- Cooperate and collaborate in these developments, as appropriate, with other science data and archive centers.

III. Astrophysics Data Format

FITS (Flexible Information Transport System) is the internationally adopted standard for the formats of astrophysical images and data files. The contractor shall assure that the ADF provides logistical support for the various FITS committees. The contractor shall support, propagate, and document FITS and its usage by the ADF, NASA data services, all NASA astrophysics missions, past, present, and future, and in the community in general.

Specifically, the contractor shall:

- Participate in the development of FITS standards through support of and participation in the IAU FITS committee, the NOST FITS technical panel, the AAS Working Group on Astronomical Software, the various discipline and mission working groups, and the FITSBITS exploder and related Web forums.
- Support the NOST in the formal issuance and updates of FITS standards documents.
- Promote, document, and support the use of FITS standards through maintenance of WWW pages containing FITS documents and links to other FITS sites worldwide.
- Promote FITS and the FITS office through displays/presentations at AAS meetings.

- Provide other services to the FITS community as may be requested by the various FITS working groups, within available resources.

GODDARD SPACE FLIGHT [illegible] ITER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-		
Raytheon STX Corporation	98156		
	TASK ASSIGNMENT NO. 103	JOB	JON: 631-399-22-12-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
W. M. Lawson	631 6-3431	R. L. Pisarski	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

XTE Science Data Center (XSDC)

Provide support for the high-energy astrophysics mission called XTE in the following areas:

- Assist the ATR in planning development, operation, and maintenance of the XSDC data processing system;
- Perform XSDC data processing operations; and
- Perform ongoing XSDC development, maintenance, and integration as mission needs warrant.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens

SIGNATURE OF CONTRACTING OFFICER

August 12, 1999

DATE

Mary V. Stevens
Contracting Officer

TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-48 (7/71)

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5- 98156		
Raytheon STX Corporation	Task No. 104	OE	JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
D. T. Leisawitz	631 6-0807	R. L. Pisarski	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

Infrared/Submillimeter/Radio Astrophysics Data Management

The contractor shall perform the following tasks applicable to each of the NASA astrophysics missions COBE, IRAS, SWAS, MAP, ISO, SOFIA, MSX,WIRE, SIRTF, 2MASS, and possibly others identified by the Government: Planning and Communication, Interactions with Projects, Improving Data Management Processes, Data Processing, Data Archiving and Archive Quality Assurance, Archival Research Support, Miscellaneous, and General Guidelines.

See attached sheets for detailed task description.

No hardware will be purchased/leased under this task assignment without the approval of the Contracting Officer.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-45 (7/71)

IR/Sub-mm/Radio Astrophysics Data Management

The contractor shall perform the following tasks applicable to each of the NASA astrophysics missions COBE, IRAS, SWAS, MAP, ISO, SOFIA, MSX, WIRE, SIRTF, 2MASS, and possibly others identified by the Government:

A) Planning and Communicating

Participate in planning for future SSDOO science data operations responsibilities, such as those pertaining to MAP, SWAS, and 2MASS.

Maintain current knowledge of the status of all NASA astrophysics missions starting at the time of proposal. For each mission designated by the Government, assign a scientist primary responsibility for appropriate aspects of end-to-end data operations.

Generate and maintain Web-based descriptions of missions, instruments, and planned or publicly available data products. Some such descriptions should be designed to serve the research community, others to serve the general public, educators, and students. Along with this information, provide links to related Web pages, data kept on-line or near-line, and data-ordering forms, as appropriate.

Maintain a Web site that provides access to current PDMPs for all of NASA's IR/sub-mm/radio astrophysics missions and projects.

B) Interactions with Projects

Offer to missions at the proposal or Phase A stage advice on end-to-end data operations (*e.g.*, specification of data-handling requirements, C&DH subsystem design, Guest Investigator program planning, associated cost estimates, etc.). Provide Systems Engineer, Programmer Analyst and Scientific Data Analyst consultation support as needed.

Help projects develop Project Data Management Plans (PDMPs) and design data products; provide advice on relevant standards (*e.g.*, FITS), data handling techniques (*e.g.*, compression), etc.

C) Improving Data Management Processes

Determine and implement methods designed to lower the cost of development and operation of future astrophysics mission data processing and data delivery systems.

Develop and apply interfaces and techniques that facilitate the archiving of astrophysics data, information, software, and documents.

Develop methods designed to facilitate data product quality assurance and work with remote data providers to implement such methods.

D) Data Processing

Develop new science data processing systems as required.

E) Data Archiving and Archive Quality Assurance

Collaborate with colleagues in the NSSDC and ADC to establish and maintain a permanent data archive designed to ensure the long-term integrity of astrophysics mission data.

Perform quality assessments of the NSSDC and ADC astrophysics archives, and determine ways to improve the archive quality.

Perform appropriate quality assurance of new data products to be archived prior to ingest into the archive.

Perform selected archival assessment, and continually improve the archive documentation, accessibility, and software applications.

Ensure protection of proprietary data.

Perform appropriate "value-added" work (*e.g.*, develop cross-mission data catalogs).

F) Archival Research Support

Support Guest Investigators: assist in the development of data browsing and analysis software and related documentation, staff GI facilities, serve as point of contact for information about usage of mission data, provide user support by e-mail and phone.

Support all aspects of data dissemination, including development of access requirements (in what turnaround time?, on what medium?, in what format?), CD-ROM development and production, appropriate announcements of data availability, meeting presentations and demonstrations, off-line request processing, etc., and provide proprietary data dissemination capability.

Develop user interfaces to the mission data products that enable expeditious location and delivery of the relevant data to the research community and provide appropriate data browsing capabilities.

Participate in the development of interfaces to archived COBE and complementary data, and models of the infrared sky.

Provide expert scientific support to COBE Guest Investigators.

Index and prepare COBE hardcopy documentation for scanning (*i.e.*, conversion to digital images).

G) Miscellaneous

Provide technical editing and graphics design support as needed to accomplish other subtasks.

H) General Guidelines

Always look for new and better ways to use state-of-the-art technology to improve the flow of data from "end to end," and bring them to the attention of the Government.

Cooperate and collaborate in these developments, as appropriate, with other science data and archive centers.

GODDARD SPACE FLIGHT CENTER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	98156 Task No. 105 01 JON: 631-399-23-01-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
R. L. Pisarski	631 6-9392		J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of ASCA Data Processing and Data Distribution Support task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-48 (7/71)

ASCA Data Processing and Data Distribution Support Task

The contractor will support the ATR and the ASCA project in the following activities:

- Generate the pipeline processing test plan which will be used to perform quality assurance and to determine the validity of the data products.
- Ensure that the ASCA data are appropriately documented for archival use.
- Generate and distribute trend data and other data files as specified by the Project Scientist.
- Ensure that proprietary data are protected from public access.
- Maintain and enhance the ASCA science data processing system and its public access modes (World Wide Web HTML access pages and PGP encrypted proprietary archive.

GODDARD SPACE FLIGHT (NTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon STX Corporation	98156	
	TASK ASSIGNMENT NO. 106	JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
R. L. Pisarski	631 6-9392		J. J. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Browser/Data Mining and Ultraviolet and Optical Data Archive.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through ~~November 30, 1999~~ April 19, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

August 12, 1999

Mary V. Stevens

SIGNATURE OF CONTRACTING OFFICER — DATE — TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-48 (7/71)

Browser/Data Mining and Ultraviolet and Optical Data Archive

This task is composed of two sub-tasks. These subtasks are: Browser/Data Mining prototype development for Knowledge Discovery in Databases (DM/KDD) tools, and Support for the Ultraviolet and Optical Data Archive. The non-personal services required under this task assignment include:

I -- Intelligent Software Agent Research

Develop Browser/Data Mining tools to assist the scientific research community in navigating the vast world wide science data and science information services. These should be designed to serve the scientific research community, the general public, educators, and students as appropriate. Develop tools that enable expeditious location, delivery, and basic analysis of the relevant information to the community and provide appropriate interaction capabilities. The initial browser/data mining tools will focus on UV data sets and ADC catalogs.

II -- Support for the Ultraviolet and Optical Data Archive

- Support the NASA UV/Optical Science Archive Research Center in creating and maintaining data, software and information archives.
- Support the NASA Flight Projects in creating and maintaining data, software and information archives.
- Acquire Ultraviolet and Optical Data, and appropriate Software to be placed in the NASA archives as needed.
- Assist in the acquisition and archiving of UV and optical data products, Models, Atomic Physics Data, and Software of interest to the NASA community.
- Scientists are expected to spend about twenty percent (20%) of their time conducting research related to their responsibilities, publishing results in appropriate journals, and presenting them at relevant meetings.
- Plan, develop, code and maintain programs used in these task activities.
- Work actively with related tasks and groups.
- Prepare and disseminate adequate and timely documentation concerning the activities performed in satisfying the requirements of this task.
- Generate other reports as appropriate.

National Aeronautics a
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

April 19, 1999

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Order Number 106

Task Order Number 106 "Browser/Data Mining and Ultraviolet and Optical Data Archive" is hereby cancelled. The cancellation is effective April 19, 1999.

Please acknowledge receipt of this cancellation by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

Mary V. Stevens

Mary V. Stevens
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Julie Smith 4/19/99 (via fax)
Signature Date

Julie Smith
Name

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	98156
	Task No. 107 OE JON: 631-399-21-20-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
R. L. Pisarski	631 6-9392		J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of ROSAT Data Processing and Data Distribution Support task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-45 (7/71)

ROSAT Data Processing and Data Distribution Support Task

The contractor will support the ATR and the ROSAT project in the following activities:

- Generate the pipeline processing test plan which will be used to perform quality assurance and to determine the validity of the data products.
- Ensure that the ROSAT data are appropriately documented for archival use.
- Generate and distribute trend data and other data files as specified by the Project Scientist.
- Ensure that proprietary data are protected from public access.
- Maintain and enhance the ROSAT science data processing system and its public access modes (World Wide Web HTML access pages and PGP encrypted proprietary archive.
- Assist the project in developing plans, schedules and procedures to ensure a successful shut down of mission data processing and archiving.

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon STX Corporation	98156	
	TASK ASSIGNMENT NO. 108	JON: 631-440-05-97-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
R. L. Pisarski	631 6-9392		J. E. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached description of work for Astro-E Software Development task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens
SIGNATURE OF CONTRACTING OFFICER

August 12, 1999
DATE

Mary V. Stevens
TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-48 (7/71)

ASTRO-E Software Development Task

Astro-E is a future collaborative high-energy astrophysics mission between NASA and ISAS. One of NASA's responsibilities will be to develop software that will process the scientific data from this satellite. The contractor shall provide support for the high-energy astrophysics mission ASTRO-E in the following areas:

- Assist the ATR in developing the data processing system.
- Assist the ATR in developing scientific analysis software to be used in the data processing system.
- Assist the ATR in developing the archiving and data distribution systems.
- Assist the ATR in developing calibration software as well as help setting up calibration data bases used in the mission.
- Maintain individual software modules and integrate the whole data processing system.
- Assist the ATR in developing software to enable analysis of satellite data.

Duties also include using electronic bulletin boards and electronic mail to keep up to date on current technical information and maintain professional contacts.

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon STX Corporation	98156	
	TASK ASSIGNMENT NO. 109 / JO	JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
for James G. Green M. E. Van Steenberg	631 6-7876	R. L. Pisarski	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Kinematic Modeling of Interstellar Absorption by Galactic Halo Gas task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Kinematic Modeling of Interstellar Absorption by Galactic Halo Gas

The contractor shall develop the software needed to reduce IUE high dispersion data for interstellar lines and to compare these line profiles to models of the distribution of highly ionized gas in the Galactic halo.

The goal of this task will require robust spectral extractions of deep interstellar lines from IUE high dispersion data. This aspect of the work will require the contractor to assess the veracity of the NEWSIPS spectral extractions and their usefulness for such analyses.

A final report will be delivered and, if warranted, a paper will be submitted for publication.

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon ITSS	98156	
	TASK ASSIGNMENT NO. 110	JOB ORDER NO. 6B1-632-70-08-01

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
Michael E. Van Steenberg	631 6-7876	R. L. Pisarski	J. L. Green for Nancy Lambert 9/24/1999

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Autonomous Distributed Spacecraft Control, Science Collection and Advanced Simulation Technology task.

b. SCHEDULE OF PERFORMANCE

09/30/99 - 11/30/99

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens
Contracting Officer

Mary V. Stevens
SIGNATURE OF CONTRACTING OFFICER

SEP 30 1999
DATE

TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Autonomous Distributed Spacecraft Control, Science Collection and Advanced Simulation Technology

The objective is to support the development of a simulation environment that supports autonomous distributed spacecraft control and test science collection techniques using artificial intelligence (AI) technologies. This work is in collaboration with the GSFC's Guidance, Navigation and Control Center and JPL's Automation and Control group.

The contractor shall support the following activities and contribute to reports and white papers as appropriate.

- Evaluate Science Quick-look Analysis Tools (*e.g.*, HEASARC) for use as on-board analysis tools
- Define Typical Science Driven Maneuver Automation Requirements
- Define Typical Science Automation Requirements
- Define Basic System Architecture
- Rapid prototype development to demonstrate key capabilities

National Aeronautics a
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

September 30, 1999

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Assignments

In accordance with Contract Clause C.4 "Task Assignments and Reports (Applicable to CLIN 2)," enclosed is a fully executed copy of Task Assignment 110. As required by Clause C.4, please submit the Contractor Task Report, for this task, concurrent with the next monthly report called for by the contract.

Please acknowledge receipt of this Task Assignment by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

Mary V. Stevens
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Julie Smith 10/4/99
Signature Date

Julie Smith
Name

GODDARD SPACE FLIGHT CENTER

TASK ORDER

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
Raytheon ITSS Corporation	NAS5-98156	111

4. JOB ORDER NO./PROJECT:	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE) :	6. DESIGNATED FLIGHT ASSURANCE MGR.:
633-212-65-21-01	___ YES X NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED) :

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

See attached for detailed Statement of Work for ISAIA Development Support.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

See Attached SOW

9. PERFORMANCE/MILESTONE SCHEDULE:

09/30/99 - 11/30/99

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:
Cynthia Y. Cheung/631/x6-2780

14. BRANCH APPROVAL:	15. DIVISION CONCURRENCE:
Ryszard L. Pisarski	James L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:
Mary V. Stevens

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE:
Roger L. Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

Mary V. Stevens
CONTRACTING OFFICER'S SIGNATURE/DATE

SEP 30 1999

Mary V. Stevens
TYPED OR PRINTED NAME

STATEMENT OF WORK

ISAIA DEVELOPMENT SUPPORT

The Interoperable Systems for Archival Information Access (ISAIA) project is a collaborative effort between Space Science data centers and data service providers in the emerging Space Science Data System. Building upon the existing data services and communications protocols, this service will allow users to transparently query the distributed web-based resources from a single interface.

The specific roles of the Astronomical Data Center (ADC) and the National Space Science Data Center (NSSDC) in the ISAIA collaboration are: (1) to define the data profile and format that will enable interoperability between the different system elements, and (2) to support the development of a data integrator prototype. The contractor shall:

- Support the development of the ISAIA interoperability profile and format
- Participate in efforts to define metadata standards
- Participate in the development of the ISAIA data integrator prototype, leveraging the other R&D efforts, such as the ADC External Query utility and the XML conversion project.
- Solicit input from Space Science discipline scientists for user requirements
- Attend meetings with other ISAIA collaborators as directed by the ATR

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

September 30, 1999

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Assignments

In accordance with Contract Clause C.4 "Task Assignments and Reports (Applicable to CLIN 2)," enclosed is a fully executed copy of Task Assignment 111. As required by Clause C.4, please submit the Contractor Task Report, for this task, concurrent with the next monthly report called for by the contract.

Please acknowledge receipt of this Task Assignment by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

Mary V. Stevens
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Julie Smith 10/4/99
Signature Date

Julie Smith
Name

GODDARD SPACE FLIGHT CENTER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
RAYTHEON	98156	
	TASK ASSIGNMENT NO. 112	JOB ORDER NO. 587-315-00-12-01

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
JAMES B. BYRNES	587.0 6-3076	James B Byrnes 5/24/00	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

TASK NAME: Space Science Data Mining 587

See Attached Task Description

b. SCHEDULE OF PERFORMANCE

June 1 - ~~December~~ NOVEMBER 30, 2000

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens	06/13/00	Mary V. Stevens
SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Statement of Work:

Task Name: Space Science Data Mining (June 1 - ~~December 30, 2000~~ November 30 2000 MHP)

Objective:

The objective of this study is to carry out an analysis of the data mining activities to be performed in space science and astronomy.

Approach:

In recent months, various methods of data management have been viewed as approaches to control and access NASA's ever-growing data holdings, most especially the multi-terabyte astronomy databases soon to be released. These approaches that have been discussed include data mining, data warehouse techniques, large database indexing schemes, parallel techniques for drill-downs into very large databases, query results previewing techniques for refining queries (and hence to minimize the volume of data retrievals) from very large databases, etc. Several meetings will be coming up that will lay some of the foundations for the data management activities of the future. One meeting that will be coming up is "Mining the Sky" (at Garching/ESO/MPE/MPA, Germany) : July 31 - August 4. Another meeting is "Virtual Observatories of the Future" (at Caltech, Pasadena) : June 13-16.

It is important that both Code 587 and Code 631 have representation at these meetings and have access to the information presented at the meetings. Both branches are interested in building expertise in these data management areas.

The contractor will need to attend both meetings and would be required to deliver summaries of the data management approaches and problems discussed. The contractor will support team meetings between 587 and 631 on data mining and data management techniques. The contractor will attend meetings and provide science expertise to current data mining efforts. The contractor will participate in efforts to outline a planning document for future work to be performed synergistically by the two codes.

Milestones and Deliverables:

Status meetings should be held at least every two months. A report documenting the data mining activities outlined in the objective should be supplied by the end of the task.

GODDARD SPACE FLIGHT CENTER

TASK ORDER

PAGE OF

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.: 113
Raytheon ITSS	NAS5-98156	631-839-40-14-78

4. JOB ORDER NO./PROJECT:	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE) :	6. DESIGNATED FLIGHT ASSURANCE MGR.:
	___ YES X NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED) :

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

TASK NUMBER 113

See attached for GLAST Task Description.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

9. PERFORMANCE/MILESTONE SCHEDULE: 06/13/00 - 11/30/00

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:
Richard L. Fink/631/6-2543

14. BRANCH APPROVAL:
R. L. Pisarski

15. DIVISION CONCURRENCE:
James L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE:
Roger L. Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

Mary V. Stevens 06/13/00
CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens
TYPED OR PRINTED NAME

GSFC 18-45 (9/94)

GLAST Task Description

GLAST is a multipartner gamma ray survey mission with a GO observation component. The ADF will provide a prototype public archive design using Beowulf and other related technology. The prototype will implement the archive design using the Compton Gamma Ray Observatory EGRET data set.

The contractor shall provide personnel to support the following tasks:

- Systems administration support of the Beowulf cluster.
- Programming support as requested for implementing the archive prototype.

GODDARD SPACE FLIGHT CENTER

TASK ORDER

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
Raytheon ITSS	NAS5-98156	631-399-20-01-13

4. JOB ORDER NO./PROJECT:	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE) :	6. DESIGNATED FLIGHT ASSURANCE MGR.:
	___ YES X NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED) :

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

See attached.

TASK ORDER NUMBER: 114

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

See attached.

9. PERFORMANCE/MILESTONE SCHEDULE: 05/12/00 - 11/30/00

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:

Michael E. Van Steenberg/631/6-7876

14. BRANCH APPROVAL:

Tyszard L. Pisarski

15. DIVISION CONCURRENCE:

James L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE:

Roger L. Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

MAY 12 2000

Mary V. Stevens

CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens

TYPED OR PRINTED NAME

Improved IUE Data Mining Tools and High Dispersion Extraction Software

The objective is to support the development of an improved IUE NEWSIPS high dispersion extraction algorithms based on more robust localized extraction methods and the development of an initial Data Mining tool for IUE data as a Serendipitous Time Series Browser. This work is in collaboration with thethe U.S. Naval Observatory.

The contractor shall support the following activities and contribute to reports as appropriate:

- Evaluate use of the Linearized Image (LIHI) file versus the Re-Sampled Image (SIHI) file; and various extraction methods (Gaussian Extraction, Optimal Extraction, Boxcar, etc.)

- Develop an extraction software package that is compatible with the IUE Data Analysis Center (IUEDAC) software environment and make it publicly available via the Space Science Data System (SSDS) and/or the Multi-Archive at Space Telescope (MAST) facility

- Develop a time series based data mining browser with links to the individual observations

- Rapid prototype development to demonstrate key capabilities

GODDARD SPACE FLIGHT CENTER

TASK ORDER

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.: 114
Raytheon ITSS	NAS5-98156	631-399-20-01-13

4. JOB ORDER NO./PROJECT:	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE) :	6. DESIGNATED FLIGHT ASSURANCE MGR.:
	___ YES X NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED) :

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

See attached.

TASK ORDER NUMBER: 114

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

See attached.

9. PERFORMANCE/MILESTONE SCHEDULE: 05/12/00 - 11/30/00

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:
Michael E. Van Steenberg/631/6-7876

14. BRANCH APPROVAL:
Tyszard L. Pisarski

15. DIVISION CONCURRENCE:
James L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE:
Roger L. Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

MAY 12 2000
Mary V. Stevens
CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens
TYPED OR PRINTED NAME

Improved IUE Data Mining Tools and High Dispersion Extraction Software

The objective is to support the development of an improved IUE NEWSIPS high dispersion extraction algorithms based on more robust localized extraction methods and the development of an initial Data Mining tool for IUE data as a Serendipitous Time Series Browser. This work is in collaboration with thethe U.S. Naval Observatory.

The contractor shall support the following activities and contribute to reports as appropriate:

- Evaluate use of the Linearized Image (LIHI) file versus the Re-Sampled Image (SIHI) file; and various extraction methods (Gaussian Extraction, Optimal Extraction, Boxcar, etc.)

- Develop an extraction software package that is compatible with the IUE Data Analysis Center (IUEDAC) software environment and make it publicly available via the Space Science Data System (SSDS) and/or the Multi-Archive at Space Telescope (MAST) facility

- Develop a time series based data mining browser with links to the individual observations

- Rapid prototype development to demonstrate key capabilities

GODDARD SPACE FLIGHT CENTER

TASK ORDER

PAGE OF

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.: 115
Raytheon ITSS	NAS5-98156	631-740-70-02-78

4. JOB ORDER NO./PROJECT:	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE) : ___ YES X NO	6. DESIGNATED FLIGHT ASSURANCE MGR.:

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED) :

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

TASK NUMBER 115

See attached for Swift Task Description.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

9. PERFORMANCE/MILESTONE SCHEDULE: 06/13/00 - 11/30/00

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:
Ryszard L. Pisarski/631/6-9392

14. BRANCH APPROVAL:

15. DIVISION CONCURRENCE:
James L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE:
Roger L. Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

Mary V. Stevens 06/13/00
CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens
TYPED OR PRINTED NAME

GSFC 18-45 (8/94)

Swift Task Description

Swift is a multipartner gamma ray burst detection and follow-up observation mission. The Astrophysics Data Facility (ADF) will provide science data processing pipeline design, development, and operations. In addition, the ADF will be responsible for providing Quicklook processing to the Swift Mission Operations Center (MOC) at Pennsylvania State University (PSU). The final outputs of the pipeline processing will be delivered to the HEASARC at GSFC and to project partners in England and Italy.

The contractor shall provide personnel to support the following tasks:

- Develop a top-level design for the science data pipeline employing standards and methodologies that are determined by the Swift project and ATR. This design shall:
  - Be based on the Space Telescope Science Institute pipeline system OPUS;
  - Be implemented on Linux and commodity PC hardware;
  - Provide the ability for project partners to run all or part of the pipeline at their sites;
  - Provide multiple pathways for data to be processed in order to minimize the time between observation and completed FITS data being made available through the HEASARC and the project partners;
  - Provide high speed services for the QuickLook processing to the MOC at PSU;
  - Usie HEASARC Ftool-type programs supplied by project partners;
  - Provide 24/7 operations with only single shift manpower support; and
  - Be extensible for changes in data products after launch.
- Develop design documents explaining the system design for presentation at the Preliminary Design Review.
- Develop a working relationship with data interface partners at PSU, the HEASARC, and in England and Italy.
- Develop a final pipeline design.
- Develop design documents for explaining the system design for presentation at the Critical Design Review.
- Develop a design for the Swift telemetry-to-FITS converter including:
  - Method of regression testing

  - Ability to develop in stages from incomplete requirements
  - Provide support to project partners for executing the software

- Develop the telemetry-to-FITS converter from the design:
  - Provide programming support during pre-launch and flight operations
  - Provide use support to project partners to run the software at their sites
  - Provide programming support to maintain the software during flight operations

- Develop an operations plan (pre-launch)
  - Assure correct data flow between project partners
  - Assure maximum automation and minimum manpower

- Implement the operations plan (flight)
  - Enhance and revise to correct for deficiencies uncovered in flight operations

- Develop tracking tools to verify data flow from the MOC to the archive sites and to record it permanently.

- Maintain contact links to the ATR to keep him apprised of contractor activities and status.

- Provide monitoring of project internal email help services and answer questions within the knowledge range of the staff unless specifically told no to by the project scientist.

- Provide staff attendence at project meetings.

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

December 4, 2002

Reply to Attn of: 210.8

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Cancellation of Task Assignment 115

The subject task, which provides support to the SWIFT Mission, is hereby cancelled.

If you have any questions, I can be reached at 301-286-6993.

James S. King
Contracting Officer

Cc: 630/Green, Dilling, Gaunt

GODDARD SPACE FLIGHT CENTER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	98156 Task No. 201 DE JON: 632-287-27-07-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
Richard J. Burley	632 6-2864	R. E. McGuire	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached description of "IMAGE Mission Data System" task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-45 (7/71)

IMAGE Mission Data System

The Imager for Magnetopause-to-Aurora Global Exploration or IMAGE is a first MIDEX class mission, selected by NASA in 1996, to study the global response of the magnetosphere to the changes in the solar wind (cf. http://image.gsfc.nasa.gov/). It will utilize neutral atom, ultraviolet, and radio imaging techniques. Major changes occur to the configuration of the magnetosphere from quiet times to disturbed times as a result of changes in and on the sun, which in turn change the solar wind.

The SSDOO is responsible for the development of the IMAGE mission data system. The contractor shall support efforts to develop, test, and implement the IMAGE data system. The IMAGE Mission has a completely open data policy with no periods of proprietary data rights. The IMAGE data system shall be able to process the IMAGE Level 0 data into Level 1 data and a series of browse products, and distribute all IMAGE data. The Level 0 data will be delivered to IMAGE investigators and to the NSSDC for long term archiving and distribution along with a series of browse and other calibrated data products.

The NSSDC will immediately place these IMAGE data on-line in the NASA Data Archive and Distribution Service (NDADS) system for rapid access by the space science community. For this technology and research element the contractor shall:

- Participate in the development and testing of the IMAGE data processing system utilizing a variety of expert system and Artificial Intelligence technologies.

- Participate in the development and testing of the IMAGE WEB based data access and display system.

- Participate in the development and testing of the IMAGE data distribution system.

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	98156
	Task No. 202
	JON: 632-370-16-13-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
R.E. McGuire / Shing F. Fung FOR S.F. FUNG	632 6-6301	R.E. McGuire R. E. McGuire	J.L. Green J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

Magnetospheric Modeling and Analysis

This task calls for (1) the performance of analysis supporting the development of a new generation of trapped radiation; (2) documentation and analysis support in ongoing SSDOO research program on the outermagnetosphere; and (3) ISTP campaign coordination.

See attached sheets for detailed task description.

[illegible]

b. SCHEDULE OF PERFORMANCE

[illegible]

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-48 (7/71)

(1) MODELING OF TRAPPED PARTICLE RADIATION ENVIRONMENT

For this portion of the task, the goal is to support the development of a new generation of models of the trapped particle radiation (both electrons and ions) in the magnetosphere. These models will be used to predict the characteristics of trapped energetic particles as functions of location and geophysical conditions. They will have potential applications in space mission planning, analysis of spacecraft measurements and understanding of the space environment, and in the development of spacecraft instrumentation.

This task can be accomplished by evaluating existing trapped radiation data sets and models (empirical and theoretical), identifying and implementing improvements needed to update the existing models and to create the next generation models. Wherever possible, analyses should take into account physical considerations such that understanding and formulation of the models can have physical basis.

The non-personal services required under this task assignment will include an appropriate combination of the following activities:

Empirical analyses -

- assess the practicalities of existing radiation belt models in providing adequate prescriptions of the particle radiation environment of the magnetosphere (taking into account the different geomagnetic conditions and radiation sources, *etc.*) (see Deliverables);
- identify and acquire selected key data sets (*e.g.*, ISEE, AMPTE, CRRES, UARS, SAMPEX, GOES, NOAA, LANL, GPS, POLAR *etc.*, in the existing archives at the NSSDC or elsewhere) suitable for the construction of an empirical radiation belt model;
- investigate the roles of the atmosphere and ionosphere in defining the low altitude cutoffs of trapped energetic particles;
- pursue appropriate data-intensive analyses in order to update, improve or extend upon existing empirical radiation belt models and to develop a prototype of a next generation radiation belt model;
- maintain and increase the confidence level of any empirical models developed by testing the models with available spacecraft data or against theoretical models;

Theoretical analyses -

- support analytical and computational studies of particle tracing, transport, and plasma convection with appropriate initial and boundary conditions to model the steady-state and time-variable conditions of the trapped radiation environment;
- determine the characteristics of the trapped particles, for examples, in terms of their sources and sinks, energetics, charge states, distributions, compositions and life times;
- compare results with spacecraft data and empirical models;
- construct as appropriate and feasible a prototype new generation model of the trapped particle environment;

(2) SUPPORT IN STUD\. .\G THE PHYSICS OF OUTER MA. .\ETOSPHERE

For this portion of the task, the goal is to add to the body of knowledge which characterizes the Earth's bow shock, magnetosheath and magnetopause. This task will support analyses of data the NSSDC archives (e.g., ISEE, Hawkeye, etc.) and from experiments onboard existing spacecraft of ISTP/IACG programs. This support will enable science analyses relating to studies of the Earth's outer magnetosphere. Specific activities may include those outlined below, as approved.

- Participate in science studies of the Earth's bow shock and magnetopause, including identification of "Events", analysis and writing science papers.
- Support science analyses through identification and acquisition of high resolution data, conversion to CDF, and creation of summary data plots.
- Support bow shock science analyses through various WWW-based activities such as:
  - Construction and maintenance web-based data bases to track bow shock "events";
  - Construction and maintenance of plotting capabilities to access and analyze bow shock event data;
  - Construction and maintenance of shock analysis software with upgrades as necessary;
- Participate in other bow shock related activities as identified at team meetings.
- Participate in studies of plasma flows in the magnetosheath and outer magnetospheric boundaries (e.g., cusp)

(3) ISTP CAMPAIGN CO[illegible]DINATION

The objective of this portion of the task is to enable effective access to high-resolution science data of the ISTP Program. Task support is required to:

- Provide ISTP PI teams with master KP skeleton table and sktedit tool and to work with them to produce new skeleton table(s) for higher resolution and/or definitive data;
- Work with the PI teams to create CDFs (through either running MakeCDF, helping them write instrument specific code, or providing documentation and contact to CDFsupport);
- Obtain sample data written in CDF(s) from the PI teams, make SFDUs and send one CDF-SFDU pair from each instrument to the CDHF for testing. Continued support is required until the CDHF is ready to accept the full data sets. Process and Move all CDF-SFDU pairs to the CDHF. After successful ingest at the CDHF, all the data in CDF will be sent to the NSSDC and ingested into NDADS or the CDAWeb (proprietary area);
- Review, validate and test ISTP data newly ingested into NDADS or CDAWeb and work with data provider to resolve any problems. Release data for public access after either one month or data provider's concurrence; and
- Provide status reports and problem descriptions (if any) at ALL stages. Effective communication is crucial to the overall success of this effort.

For items (1), (2) and (3) above, the Contractor will also support presentations of significant results in scientific meetings and publish in professional journals and technical reports. Finally, the Contractor will also

- Participate with other SSDOO organizational elements to support the effective operations and continued development of SSDOO;
- Prepare, update and disseminate timely adequate documentation concerning the activities and products resulting from the requirements and performance of this task; and
- maintain cognizance and advise Government of the latest developments in appropriate technical areas.

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon STX Corporation	98156	
	TASK ASSIGNMENT NO. 203	JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
R. L. Kessel	632 6-6595	R. E. McGuire	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Space Science Visualization Facility task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens — SIGNATURE OF CONTRACTING OFFICER

August 12, 1999 — DATE

Mary V. Stevens — TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-48 (7/71)

Space Science Visualization

This task supports the Space Science Visualization activities within the SSDOO. The activities of this task will be accomplished by working closely with key members of the space science community in order to create appropriate space science visualization products.

This task provides value added visualization services to the SSDOO, the Space Sciences Directorate and associated science missions such as ISTP. Support to specific SOW elements include but are not limited to: 2.8 Astrophysics, 3.6 Data Products, and 4.7 Educational Activities.

Task activities include:

- Creating illustrations that capture the salient properties of 2D and 3D physical processes from archival data, simulations, archival models, and then will be used as still frames in videos and/or as graphics for 2D and 3D animations;

- Developing and producing 2D and 3D animations for use on the WEB, presentations, or within publications;

- Producing videos from these animations and stills, in standard (e.g., beta and VHS) formats;

- Producing movies as quick time or in other formats for SSDOO WEB pages and presentations;

- Maintaining an on-line archive of animation products on appropriate media,

- Establishing and maintaining a WEB site featuring samples of the group's work, contact information, and a description of work that is be done under the task;

- As necessary, interacting with the SSDOO, GSFC Public Affairs office, the ISTP Project, NASA Headquarters, and members of the Space Science Directorate to make finished products available to the education community and the general public.

GODDARD SPACE FLIGHT CENTER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon STX Corporation	98156	
	TASK ASSIGNMENT NO. 204 J	JON: 632-370-03-00-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
R. E. McGuire	632 6-7794	R.E. McGuire	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

Space Physics Software Development, System Maintenance and Special Projects

Key elements of this task include:

- Continued CDAWeb software, database and tools development and maintenance;
- Continued SSC software development and system maintenance;
- General user support for the CDAWeb and SSCWeb software systems; and General and Logistics Support to the IACG.

See attached sheets for detailed task description.

No hardware will be purchased/leased under this task assignment withoutthe approval of the Contracting Officer.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens — SIGNATURE OF CONTRACTING OFFICER

August 12, 1999 — DATE

Mary V. Stevens — TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Space Physics Programs, S/W Development, System Maintenance and Special Projects

The non-personal services required under this task assignment include:

(CDAWeb and Related System/Application Development)

- Identify and implement with appropriate design, documentation and system configuration control , further enhancements to the functionality and performance of all appropriate elements of the CDAWeb system necessary to continue effective operations and to support campaigns or workshops;
- Demonstrate, maintain, monitor (including appropriate usage and performance statistics) and support hardware upgrades of the CDAWeb system;
- Maintain and extend the CDAWeb databases necessary to continue effective operations and to support campaigns, workshops, or enhanced science community and public access to archival data;
- Build, maintain and develop tools and libraries supporting this effort, including further development of data formatting (*e.g.*, skeleton-editor, makeCDF, makeSFDU) and local data display (*e.g.*, CDAWlib) tools;
- Support the distribution of the software and database as appropriate to ISTP and other NASA-sponsored facilities or other international agencies or facilities.

(SSC S/W Development)

- Identify and implement with appropriate design, documentation and system configuration control , further upgrades to the functionality and performance of the SSC software;
- Support maintenance and monitoring of this system, appropriate system administration aspects of the operational SSC and its database, and cooperative use (and hosting) of the SSC database by the ISTP SPOF;
- Support the distribution of parts of the ported and upgraded software and database as appropriate to ISTP and other NASA-sponsored facilities or other international agencies or facilities.

(User Support and Other System Maintenance)

- Provide support in appropriate system use these CDAW and SSC users;
- Help fulfill special requests for list or graphic outputs to support IACG /ISTP campaign coordination;
- Minimally maintain existing CDAW databases/catalogs and the existing CDAW system until fully superseded by the new system.

(IACG and Other Projects Special and Logistics Support)

- Support the efforts of the IACG working groups and campaigns' science analysis activities as required in planning, reporting and other work. Deliverables may include reports/minutes on key IACG working group and plenary meetings and reports on campaign planning activities/issues;

- Maintain and upgrade as necessary the Space Physics Data Availability Catalog (both software and database population);

- Provide logistics support as directed for specified meetings or workshops/attendees of or related to the goals of the IACG or other efforts, including travel reimbursement for specified participants and other essential expenses to support such meetings.

(General)

- Participate with other SSDOO organizational elements in order to maintain the effective operations and continued development of SSDOO; prepare and disseminate adequate and timely documentation concerning the activities performed in satisfying the requirements of this task; maintain cognizance and advise Government of the latest developments in appropriate technical areas.

National Aeronautics a
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

March 23, 2000

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Order Number 205

Task Order Number 205 "Space Physics Data Acquisition and Value Added Services" is hereby cancelled. The cancellation is effective March 17, 2000.

Please acknowledge receipt of this cancellation by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

Mary V. Stevens
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Julie Smith 3-29-00
Signature Date

Julie Smith
Name

GODDARD SPACE FLIGHT NTER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5- 98156	
Raytheon STX Corporation	TASK ASSIGNMENT NO. 205	JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
R. E. McGuire R.E. McGuire	632 7794 6-6301	R.E. McGuire R. E. McGuire	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:
Space Physics Data Acquisition and Value-Added Services

Key elements of the task include:

- Space Physics data and information acquisition for NSSDC, including support for reformatting, validation and ingest of appropriate data to nearline/online archives and/or for distribution as CD-ROMs, and information database population;

- Operate the Satellite Situation Center (SSC); and

- Value-added space physics services, including select mission planning support, creation of new composite space physics data/modeling products,and support in the definition of science user and OSS requirements for SSDOO systems to promote effective finding, access, and use of space physics data.

See attached sheets for detailed task description.

No hardware will be purchased/leased under this task assignment without the approval of the Contracting Officer.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens — SIGNATURE OF CONTRACTING OFFICER

August 12, 1999 — DATE

Mary V. Stevens — TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Space Physics Data Acquisition and Value-Added Services

The non-personal services required under this task assignment include:

(Space Physics Data and Information Acquisition)

This task covers the acquisition of space physics data into the NSSDC archives, and the acquisition of information into the NSSDC information bases. It involves interactions with individual scientists, spaceflight projects, NASA discipline data systems, and non-NASA entities holding space physics data and/or information of interest to the NASA research community. It also involves limited support to other NSSDC needs, including identification of evolving requirements to be satisfied by NSSDC's systems to support NSSDC customers (providers and users), and occasional support of such customers in identifying needed data.

- Act as an interface with data providers and data users to define, direct and participate as necessary in implementation of the acquisition of data and metadata into and within the NSSDC archive and the appropriate level of NSSDC support and services for all such data and metadata

- Support verification that, at the conclusion of the data ingestion process for each new data set, the online or offline bundle of data and documentation available to NSSDC scientific customers is correct and comprehensible, and sufficiently complete to support correct and independent data usage; perform other appropriate quality assessments of the NSSDC space physics data and model archives;

- Support all aspects of data dissemination, including reformatting, validation and ingest of appropriate data to nearline/online archive development of access requirements, CD-ROM development and production, and advertising appropriate announcements of data availability, meeting presentations and demonstration;

- Support development and maintenance of user interfaces to the mission data products that enable expeditious location and delivery of the relevant data to the research community and provide appropriate data browsing capabilities;

- Support the NSSDC operations staff in the identification of most appropriate data sets for the satisfaction of requests, and support NSSDC scientific customers in the identification of data sets most appropriate to specific research needs.

- Acquire information for and assure adequate population of NSSDC information files(including TRF); assure the delivery of all information acquired into these NSSDC information bases to those information bases or staff responsible for insertion of such information into the information bases. The work includes generation and maintenance of current descriptions of missions, instruments, and planned or publicly available data products. Some such descriptions should be designed to serve the research community, others to serve the general public, educators, and students;

(Operate the Satellite Situation Center)

- Acquire orbit element sets and build, maintain and extend the SSC ephemeris databases (including that of SSCWeb) as necessary to continue effective operations and to support campaigns or workshops;

- Operate the Satellite Situation Center (SSC) to support IACG and other campaign science planning activities, to assist where feasible the GGS/ISTP Science Planning and Operations Facility (SPOF) and to respond to other internal (Code 630) and external requests (e.g. FAST, IMAGE, HQs) for access or other supporting services or products by the SSC;

- Pursue those SSC activities which enable the NSSDC to satisfy its WDC-A-R&S responsibilities; assign spacecraft IDs; issue launch notices and space warn bulletins, etc.;

- Actively participate in defining the scientific requirements of the SSCWeb software system, the development of scientific/computational subroutines for SSCWeb and the testing of SSCWeb functionality;

- Provide specialized and science-expert utilization assistance to users of the SSCWeb system and database, and all related tools and services; and

(Space Physics Value-Added Services)

- Acquire, maintain and update as appropriate the IRI and other space physics models being made available for distribution (online and otherwise) by the NSSDC; support advertising and user access to these models;

- Continue to provide support for the creation, continuing population and appropriate systems to promote rapid public access (*e.g.*, via OMNIWeb and COHOWeb) of the OMNI and COHO databases and any other databases/data products as these are defined;

- Provide scientific, programming and technical support for the creation of new value-added space physics data and modeling products and their dissemination as directed;

- Actively participate in defining the scientific requirements and advanced planning new coordinated data analysis efforts and databases; actively participate in ongoing testing of the CDAWeb system;

- Appropriately support data review activities and reports to identify and prioritize key space physics data sets for archiving or archive retention and effectiveness of current mission archiving (e.g. including population assistance and review of the Space Physics Data Availability Catalog); provide scientific guidance to data restoration and preservation activities in the NSSDC and external data providers, as required

- Provide support as directed for the development, review, and execution of Project Data Management Plans and/or participation in the planning and definition of science data operations for space science missions and programs; provide advice on relevant standards, and data handling techniques

- Provide specialized and science-expert utilization assistance to space physics users of SSDOO systems and Guest Investigators: assist in the development of data browsing and analysis software and related documentation, serve as point of contact for information about usage of mission data, provide user support by e-mail and phone.

(General)

- Review appropriate journals to maintain cognizance of space physics research interests/needs and to gather information for population of TRF; assist in approved data-intensive research projects as a low-level effort where this work will result in greater levels of confidence in, and understanding and documentation of, NSSDC-held data of potential interest to NSSDC scientist-customers; pursue other activities as requested where scientific expertise will be required.

- Participate with other SSDOO organizational elements in order to maintain the effective operations and continued development of SSDOO; prepare and disseminate adequate and timely documentation concerning the activities performed in satisfying the requirements of this task; maintain cognizance and advise Government of the latest developments in appropriate technical areas.

TASK ORDER
Goddard Space Flight Center

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
Raytheon STX Corporation	NAS5-98156	205a
4. JOB ORDER NO./PROJECT:	**5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE):**	**6. DESIGNATED FLIGHT**
633-212-62-10-78	____YES __X__NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED):

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

Space Physics Data Acquisition and Value-Added Services

Key elements of the task include:

- Space Physics data and information acquisition for NSSDC, including support for reformatting, validation and ingest of appropriate data to nearline/online archives and/or for distribution as CD-ROMS, and information database population;
- Operate the Satellite Situation Center (SSC); and
- Value-added space physics services, including select mission planning support, creation or new composite space physics data/modeling products, and support in the definition of science user and OSS requirements for SSDOO systems to promote effective finding, access, and use of space physics data.

See attached sheets for detailed task description.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

9. PERFORMANCE/MILESTONE SCHEDULE: 12/01/00 - 11/30/01

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE: R. E. McGuire/632/6-7794
R. E. McGuire

14. BRANCE APPROVAL: R. E.McGuire
R. E. McGuire

15. DIV. CONCURRENCE: J. L. Green
James L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE: R. Dilling
Roger Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

NOV 30 2000
Mary V. Stevens
CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens
TYPED OR PRINTED NAME

Space Physics Data Acquisition and Value-Added Services

The non-personal services required under this task assignment include:

(Space Physics Data and Information Acquisition)

This task covers the acquisition of space physics data into the NSSDC archives, and the acquisition of information into the NSSDC information bases. It involves interactions with individual scientists, spaceflight projects, NASA discipline data systems, and non-NASA entities holding space physics data and/or information of interest to the NASA research community. It also involves limited support to other NSSDC needs, including identification of evolving requirements to be satisfied by NSSDC's systems to support NSSDC customers (providers and users), and occasional support of such customers in identifying needed data.

- Act as an interface with data providers and data users to define, direct and participate as necessary in implementation of the acquisition of data and metadata into and within the NSSDC archive and the appropriate level of NSSDC support and services for all such data and metadata

- Support verification that, at the conclusion of the data ingestion process for each new data set, the online or offline bundle of data and documentation available to NSSDC scientific customers is correct and comprehensible, and sufficiently complete to support correct and independent data usage; perform other appropriate quality assessments of the NSSDC space physics data and model archives;

- Support all aspects of data dissemination, including reformatting, validation and ingest of appropriate data to nearline/online archive development of access requirements, CD-ROM development and production, and advertising appropriate announcements of data availability, meeting presentations and demonstration;

- Support development and maintenance of user interfaces to the mission data products that enable expeditious location and delivery of the relevant data to the research community and provide appropriate data browsing capabilities;

- Support the NSSDC operations staff in the identification of most appropriate data sets for the satisfaction of requests, and support NSSDC scientific customers in the identification of data sets most appropriate to specific research needs.

- Acquire information for and assure adequate population of NSSDC information files(including TRF); assure the delivery of all information acquired into these NSSDC information bases to those information bases or staff responsible for insertion of such information into the information bases. The work includes generation and maintenance of current descriptions of missions, instruments, and planned or publicly available data products. Some such descriptions should be designed to serve the research community, others to serve the general public, educators, and students;

(Operate the Satellite Situation Center)

- Acquire orbit element sets and build, maintain and extend the SSC ephemeris databases (including that of SSCWeb) as necessary to continue effective operations and to support campaigns or workshops;

- Operate the Satellite Situation Center (SSC) to support IACG and other campaign science planning activities, to assist where feasible the GGS/ISTP Science Planning and Operations Facility (SPOF) and to respond to other internal (Code 630) and external requests (e.g. FAST, IMAGE, HQs) for access or other supporting services or products by the SSC;

- Pursue those SSC activities which enable the NSSDC to satisfy its WDC-A-R&S responsibilities; assign spacecraft IDs; issue launch notices and space warn bulletins, etc.;

- Actively participate in defining the scientific requirements of the SSCWeb software system, the development of scientific/computational subroutines for SSCWeb and the testing of SSCWeb functionality;

- Provide specialized and science-expert utilization assistance to users of the SSCWeb system and database, and all related tools and services; and

(Space Physics Value-Added Services)

- Acquire, maintain and update as appropriate the IRI and other space physics models being made available for distribution (online and otherwise) by the NSSDC; support advertising and user access to these models;

- Continue to provide support for the creation, continuing population and appropriate systems to promote rapid public access (*e.g.*, via OMNIWeb and COHOWeb) of the OMNI and COHO databases and any other databases/data products as these are defined;

- Provide scientific, programming and technical support for the creation of new value-added space physics data and modeling products and their dissemination as directed;

- Actively participate in defining the scientific requirements and advanced planning new coordinated data analysis efforts and databases; actively participate in ongoing testing of the CDAWeb system;

- Appropriately support data review activities and reports to identify and prioritize key space physics data sets for archiving or archive retention and effectiveness of current mission archiving (e.g. including population assistance and review of the Space Physics Data Availability Catalog); provide scientific guidance to data restoration and preservation activities in the NSSDC and external data providers, as required

- Provide support as directed for the development, review, and execution of Project Data Management Plans and/or participation in the planning and definition of science data operations for space science missions and programs; provide advice on relevant standards, and data handling techniques

- Provide specialized and science-expert utilization assistance to space physics users of SSDOO systems and Guest Investigators: assist in the development of data browsing and analysis software and related documentation, serve as point of contact for information about usage of mission data, provide user support by e-mail and phone.

(General)

- Review appropriate journals to maintain cognizance of space physics research interests/needs and to gather information for population of TRF; assist in approved data-intensive research projects as a low-level effort where this work will result in greater levels of confidence in, and understanding and documentation of, NSSDC-held data of potential interest to NSSDC scientist-customers; pursue other activities as requested where scientific expertise will be required.

- Participate with other SSDOO organizational elements in order to maintain the effective operations and continued development of SSDOO; prepare and disseminate adequate and timely documentation concerning the activities performed in satisfying the requirements of this task; maintain cognizance and advise Government of the latest developments in appropriate technical areas.

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon STX Corporation	98156 Task No. 301	JO JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
Curtiss Barrett	633 6-9506	J. H. King	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Computer Systems Management task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Computer Systems Management

The SSDOO utilizes a number of government-owned super-mini, mini, micro and desktop computers for performing many of the major functions of the organization. These are the Schedule B computers of the contract and run under the VMS and UNIX operating systems. Configuration management and traffic and load balancing are required for these computers. Optimization of performance and utilization of computer resources is also required. The contractor shall:

- Provide systems management support for the government-owned SSDOO Schedule B computers;
- Perform configuration management and traffic and load balancing on the Schedule B computers;
- Maintain all the existing system-level software to currently approved revision levels without adversely affecting operations;
- Maintain a systems environment that maximizes systems availability;
- Provide a level of computer systems security that protects government computers and resources from computer hackers, viruses, worms, Trojan horses, etc.;
- Perform regular system and magnetic disk backup with remote storage of the backup;
- Optimize performance and utilization of these computers;
- Provide computer operations support; and
- Manage computer output media.

TASK ORDER PAGE 1 OF 2

Goddard Space Flight Center (INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
Raytheon STX Corporation	NAS5-98156	301a
4. JOB ORDER NO./PROJECT:	**5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE):**	**6. DESIGNATED FLIGHT**
633-212-62-10-78	____YES ___X___NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED):

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

See Attached for detailed description of Computer Systems Management Task.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

9. PERFORMANCE/MILESTONE SCHEDULE: 12/01/00 - 11/30/01

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE: Curtiss Barrett/633/6-9506

Curtiss Barrett

14. BRANCH APPROVAL: J. H. King

J H King

15. DIV. CONCURRENCE: J. L. Green

James L Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE: R. Dilling

Roger Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

NOV 30 2000

Mary V Stevens

CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens

TYPED OR PRINTED NAME

GSFC 18-45 (8/94)

Computer Systems Management

The SSDOO utilizes a number of government-owned super-mini, mini, micro and desktop computers for performing many of the major functions of the organization. These are the Schedule B computers of the contract and run under the VMS and UNIX operating systems. Configuration management and traffic and load balancing are required for these computers. Optimization of performance and utilization of computer resources is also required. The contractor shall:

- Provide systems management support for the government-owned SSDOO Schedule B computers;
- Perform configuration management and traffic and load balancing on the Schedule B computers;
- Maintain all the existing system-level software to currently approved revision levels without adversely affecting operations;
- Maintain a systems environment that maximizes systems availability;
- Provide a level of computer systems security that protects government computers and resources from computer hackers, viruses, worms, Trojan horses, etc.;
- Perform regular system and magnetic disk backup with remote storage of the backup;
- Optimize performance and utilization of these computers;
- Provide computer operations support; and
- Manage computer output media.

GODDARD SPACE FLIGHT CFNTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	98156
	Task No. 302 to JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
Greg Goucher	633 6-2341	J. H. King	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Systems Networking and Small Systems task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-48 (7/71)

Systems Networking and Small Systems Task

The Space Science Data Operations Office (SSDOO)/Code 630 contains a number of disparate computational platforms that support a broad range of activities. It is paramount that the communications among theses systems, as well as to the rest of GSFC and the outside community, be reliable, dependable, and ensured the necessary bandwidth to provide adequate services. The activities of this task should be performed consistent with the overall CNE guidelines and standards as well as with the overall code 600 networking plan.

The work to be performed on this task is as follows:

Networking:

- Monitor and troubleshoot all of SSDOO networking activities.
- Integrate new hardware when necessary.
- Set up and maintain FDDI ring within buildings 26 and 28 as appropriate.
- Coordinate routing and bridging of all of building 26 communications and SSDOO communications in building 28 consistent with the CNE guidelines and standards.
- [redacted]
- Maintain building 26 and 28 detailed configurations:
  - Add new nodes
  - Delete nodes
  - Reconfigure ribs and nodes
  - Maintain CNE protocol address database
  - Maintain a detailed map of the existing environment
  - Install cabling
  - Install communications software
  - Maintain database of communications software
- Coordinate the services to the CNE/building 26 networking activities.
- Attend Code 600 networking meetings when required.

Small Systems:

- Responsible for installing, configuring, testing and maintaining computer hardware and software for Code 630 and 600 personnel as directed by the GSFC ATR.

- The hardware portion of this task covers configuring and testing of new systems (PCs, Macs, printers, and other peripheral devices) as well as re-configuring and maintaining existing systems.

- The software portion of this task covers the installation of new software when received as well as updates to existing software, including, but not limited to, Eudora, Netscape, [redacted], WordPerfect, [redacted].

GODDARD SPACE FLIGHT CENT
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	98156 Task No. 303 JC JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
David Han	633 ~~8X~~ 4-5303	J. H. King	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of NSSDC Common Data Format (CDF) task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

August 12, 1999	Mary V. Stevens Contracting Officer
SIGNATURE OF CONTRACTING OFFICER	DATE / TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-45 (7/71)

NSSDC Common Data Format (CDF)
Task Assignment for FY99

Section I: Common Data Format Maintenance and Support

This section describes the activities that are associated with the maintenance of the CDF library and its related software. It also lists the support activities needed for CDF users.

- The contractor shall maintain the following software:

  - All versions of C, Fortran, and Java CDF Application Programming Interfaces (APIs)

  - The CDF tools that are distributed as part of the standard CDF distribution package as well as the CDF tools that are used internally (e.g. CDFdump)

  This activity shall include, but is not limited to, error detection and correction, and incorporation of changes in the software.

- The contractor shall provide the necessary services to users of the CDF and its related software, and advertise and promote the capabilities of the CDF. This activity shall include ATR-approved demonstrations of the capabilities of the CDF, assistance and training in the use of CDF for scientists and their staff, assistance in porting the CDF software to remote sites (including a delivery/installation package and procedure), and joint authorship and assistance in the preparation of papers and documents describing CDF capabilities to other developers or researchers. The support activities for the NSSDC staff and user community shall include, but is not limited to, the following:

  - Teach CDF concepts and show programmers how to use CDF

  - Answer CDF inquiries, including telephone and email requests

  - Interface with NSSDC projects (e.g. CDAW, ISTP, etc.)

  - Interface with GSFC flight projects (e.g. ISTP, UARS, COBE, etc.)

  - Interface with GSFC laboratories, other NASA centers, and non-NASA groups

- The contractor shall maintain the CDF User's Guide, CDF C Reference Manual, CDF Fortran Reference Manual, and CDF Internal Format Description document. This activity includes periodic review and updates to appropriate documents.

- The contractor shall port the CDF library and its related software to new computer platform(s) should it become required.

Section II: Development/Enhancement of the CDF Library and CDF Tools

This section describes the enhancements and developments that are needed to the CDF library and its related software.

- The contractor, in coordination with the ATR, shall identify and establish a configuration control mechanism and maintain the CDF library and its related software and documents under configuration control.

- The contractor shall provide computer programs and programming support to enhance the existing capabilities of and develop new capabilities for the CDF. This involves adding some new functional capabilities and tools as new requirements emerge.

- The contractor, in coordination with CDF users, shall develop Java tools for the existing CDF tools (e.g. SkeletonTable, SkeletonCDF, etc.) as well as new Java CDF tools as new requirements arise.

- The contractor, in coordination with CDF users, shall develop Java APIs for the existing CDF APIs.

Deliverables

Section I: CDF Maintenance and Support

ITEM	DELIVERY DATE
Maintenance of CDF and its related software	Continuous
Provide support to the NSSDC staff and user community	Continuous
Review and update of CDF documents	Biannually
CDF port to new platform(s)	As required

Section II: Development/Enhancement of the CDF Library and CDF Tools

ITEM	DELIVERY DATE
Configuration control of CDF software and documents	September 1999
Enhancement of CDF library and its related software	As required
Development of Java tools	January 1998
Development of Java APIs	August 1999

Other

ITEM	DELIVERY DATE
Technical meetings	Weekly
Progress reports	Monthly

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	98156 Task No. 304 JC JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
Nathan James	633 6-9789	J. H. King	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Publications and PLES task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-48 (7/71)

Publications and PLES (Planetary and Earth Science Data Acquisition and Scientific User Support)

The data document and information archive of the NSSDC shall continually be acquired, enhanced, accessible, and maintained. This archive includes the collection of all documents produced by the Space Science Data Operations Office (SSDOO), many of which are distributed periodically. The NSSDC archive supports archival research, and allows requesters the opportunity to browse various aspects of the archive. It is important to note that NSSDC occasionally interacts with the Astrophysics Data Facility (ADF) and Space Physics Data Facility (SPDF) to accomplish many of the data and information archival functions (also see discussion of acquisition responsibilities in the Acquisition Scientist Handbook at http://nssdc.gsfc.nasa.gov/~bell/acquisition/). In this area, the contractor shall support the following functions:

- Maintain current knowledge of the status of all NASA space science missions with emphasis on planetary/lunar missions.
- Act as an interface with data providers and data users to define, direct, and participate, as necessary, in implementation of the acquisition of data and metadata into and within the NSSDC archive, and the appropriate level of NSSDC support and services for all such data and metadata.
- Generate and maintain current descriptions of missions, instruments, and planned or publicly available data products. Some such descriptions should be designed to serve the research community, others to serve the general public, educators, and students.
- Support all aspects of data dissemination, including development of access requirements, CD-ROM development and production, appropriate announcements of data availability, meeting presentations and demonstrations, offline request processing, etc
- Make the archive metadata available on the World Wide Web with links to related Web pages, data kept online or nearline, and data ordering forms, as appropriate.
- Assist in the development of data browsing software and related documentation; serve as point of contact for information about usage of mission data; and provide user support by electronic mail and telephone.
- Develop user interfaces to the mission data products that enable expeditious location and delivery of the relevant data to scientists, educators, and the general public.
- Maintain historical archive of all SSDOO documents.
- Provide quick and easy access to historical document archive.
- Distribute SSDOO publications.
- Maintain and update all distribution listings in a timely manner.

SSDOO/NSSDC Publications

The SSDOO/NSSDC Publications task provides general support to SSDOO civil service and contractor staff in the areas of editorial (online and hardcopy), layout, design, word processing, desktop publishing, graphics, presentation, scanning, proofreading, binding (GBC), and printing (offset or Xerox). Some of the NSSDC-specific support would include the publishing of the NSSDC project monthly progress report, a quarterly

newsletter, a monthly bulletin of information on satellites and space probes, a listing of NSSDC's CD-ROMs, a guide to the data and services of the NSSDC, and the NSSDC annual report.

Planetary Data Acquisitions

The planetary data acquisition function involves support and coordination of planetary data archiving activities. This includes:

- Maintaining and populating databases and metadata in the NASA Master Catalog and on the World Wide Web;
- Providing general information and support to requests and queries from scientists, educators, and the general public; and
- Acting as liaison between the Planetary Data System and NSSDC to ensure archive data set and documentation quality and compatibility between the two organizations.

HEASARC and MAST Astrophysics Data Acquisition

- Interface with NASA/OSS astrophysics active archives (e.g., HEASARC at GSFC, MAST at STScI) regarding the flow to NSSDC of data intended for permanent archiving at NSSDC.
- Populate NSSDC databases with information about these data and their sources.
- Interface with NSSDC operations staff to ensure complementarity of roles and activities related to data inflow, database population, etc.

Earth Science Data Transition

This task is responsible for notifying ESDIS of user requests for Earth science data sets still held by NSSDC. Task personnel negotiate for a clearer schedule for ESDIS to take physical possession of all ESDIS-owned data. The transition function also involves the maintenance of Earth science missions metadata.

Education/Outreach Support

Task personnel support educational outreach activities, such as resource development and distribution, training, and publicity. They also coordinate summer internships.

Web Page Development

Define, create, evolve, and maintain a set of World Wide Web homepages for The Office of Space Science's (OSS) Space Science Data Service (SSDS). This activity will involve appropriate consulting with selected members of the SSDS community on requirements and preferences.

TASK ORDER

Goddard Space Flight Center

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
Raytheon STX Corporation	NAS5-98156	304a
4. JOB ORDER NO./PROJECT:	**5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE):**	**6. DESIGNATED FLIGHT**
633-212-62-10-78	____YES ___X___NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED):

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

See Attached for detailed description of Publications and PLES Task.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

9. PERFORMANCE/MILESTONE SCHEDULE: 12/01/00 - 11/30/01

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE: Nathan James/633/6-9879

Nathan James

14. BRANCH APPROVAL: J. M. King

J. M. King

15. DIV. CONCURRENCE: J. L. Green

James L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE: R. Dilling

Roger Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

NOV 30 2000

Mary V. Stevens

CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens

TYPED OR PRINTED NAME

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GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX COrporation	98156
	Task No. 305 JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
D. M. Sawyer	633 6-2748	J. H. King	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of task for the NASA/Science Office of Standards and Technology.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Statement of Work for the NASA/Science Office of Standards and Technology

A. Task Description

This task addresses the non-CDF aspects of the SOW section 4.1 entitled "Science Data and Information Systems Standards."

I. Part 1

The contractor shall perform the necessary steps to operate and maintain the NASA/Science Office of Standards and Technology. The activities to be performed are categorized below. Further activities and schedules may be defined in later task modifications.

O Support the development of adopted, adapted, or new standards through participation in the international Consultative Committee for Space Data Systems (CCSDS) Panel 2. This will typically require travel twice a year;

- o Be prepared to serve as editor of one or more CCSDS recommendations or reports, and to assist in the NASA and GSFC reviews of draft standards;

- o The contractor shall support the development of US positions on the ISO/CCSDS archiving standards effort by assisting with meeting logistics, taking minutes, and establishing and maintaining WWW pages for both the US and ISO/CCSDS archiving meetings. The objective is to support wide access to the information and distributed participation in the process.

O Identify relevant standards and maintain expertise in the nature of these standards as they apply to NSSDC operations support;

O Participate in the appropriate standards development groups and meetings promoting the use of standards in all aspects of NASA data systems;

O Support the NSSDC lead 'Formats Evolution' process and workshops with formats analysis, new technology descriptions, and WEB page support to the process.

O Assist in and continually improve the operation of the NASA/Science Office of Standards and Technology (NOST), including the following:

- o The contractor shall operate and improve the CA Agent function in accordance with applicable CCSDS standards. This shall include continued maintenance of WWW access to global CA office registration information and maintenance of the configuration file that allows applications to link electronically to any CA office for automated services.

- o The contractor shall operate and improve the NASA/NSSDC Control Authority Office (CAO) in accordance with the established policies and procedures. This shall include maintenance of an information system, with WWW access, containing items registered with the office. Use of some or all of the free CAO software that

ESA developed is encouraged if this looks like a more cost-effective approach over the long term.

o The contractor shall maintain an SFDU Support Office, with mail, Email, and Phone number for servicing requests.

o The contractor shall assist NSSDC personnel and outside requesters in the use of the SFDU Recommendations with data products, shall maintain statistics on users and problems, and shall report this information to the Gov't on a monthly basis.

O Maintain and extend, as appropriate, the Standard Formatted Data Unit (SFDU) and related CCSDS standards;

O Develop appropriate SFDU (and related standards and formats) browsing, validation, and creation software capable of execution in a variety of computing environments; and

O Collaborate and coordinate with other groups to avoid duplication of effort.

II. Part 2

CCSDS OLIS SUPPORT FUNCTIONS AND DELIVERABLES
1998-12-01

BACKGROUND

There are a number of CCSDS Online Information System (OLIS) functions that are needed to maintain CCSDS information and documents in forms that make them accessible from the Internet. The plan is to leverage NSSDC's systems, maintenance and security support, Internet access experience, and customer support systems by having NSSDC support CCSDS WEB pages and online documents. This effort is sponsored by NASA HQ, Code MG, and controlled by Bill Poland's ADS activity through applicable SOMO funding.

NOTE: This task does not currently include responsibility for developing, maintaining, or serving Internet resources for providing NASA or other space agency views of CCSDS or related items.

What follows is a list of functions to be carried out and a designation of the responsible parties. This NSSDC task has responsibilities in all the functions.

FUNCTIONS

1. **DNS Service:** Maintain a Domain Name Service (DNS) for CCSDS (ccsds.org). Provide service 24 hours per day/7 days per week.

   NSSDC will interact with appropriate authorities (currently InterNIC) to maintain domain name registration. NSSDC will provide non-exclusive operational hardware and software to support a primary DNS with 24 hours per day, 7 days per week service at a 95% reliable level. NSSDC will interact with GSFC level DNS service to ensure adequate secondary DNS service.

NASA GSFC to provide secondary DNSs with 24 hours per day, 7 days per week service at a 99% reliable level.

ADS's only responsibility in this function is general oversight.

2. **CCSDS Publications:** Provide public access to CCSDS documents via HTTP with FTP download ability (with same reliability as access to other NSSDC FTP and Web sites). Provide related WWW pages to provide easy access to documents. Provide a WAIS index to allow for searching across document text. CCSDS document files to be available in a native word processing format with embedded graphics (MS Word or WordPerfect), PDF, PostScript (A4 and US Letter Versions) and Text. Compressed versions of the files may optionally be included. All Blue Books and all current Green and Yellow Books will be available. Red Books, except first versions, will be available. MC may also request that some first version Red Books (for example, all P2 Red Books) may be made publicly available.

   NSSDC will provide non-exclusive operational hardware and software to support FTP and HTTP access. NSSDC will move document files delivered by ADS into the publicly accessible FTP site and update the HTTP access pages (optionally could include file sizes to aid the user in making access decisions). Access pages will typically include an overall publications list with abstract and separate lists of document of each color. NSSDC will generate WAIS indexes based on the supplied text versions of documents.

   ADS will produce and deliver all versions of the document files to NSSDC machine. ADS will quality check the NSSDC produced pages and the installed documents. ADS will generate and provide abstracts for all documents.

   MC, through the normal document approval process, will approve documents that will appear on the CCSDS FTP and Web Sites.

3. **CCSDS Organization WEB Pages:** Provide access to CCSDS Web Pages including user feedback forms. Content of these pages will include information on CCSDS operational structure and charters of the organization and its elements, CCSDS history, membership lists, and related information. Provide good response times and 24 hours per day, 7 days per week access of CCSDS pages (treat as NASA home pages were treated in this respect). Responsibility for the organization and content of these pages rests ultimately with the MC. ADS is responsible to the CCSDS Secretariat in carrying out MC and Secretariat wishes in this area. NSSDC and others may recommend changes to ADS for presentation to the MC for approval. NSSDC may implement editorial changes as appropriate. See also #6 below.

   NSSDC will provide non-exclusive operational hardware and software to support HTTP access. NSSDC will create and maintain the system. NSSDC will make changes needed following ADS quality checking. NSSDC will maintain and provide the CCSDS Control Authority List.

   ADS will quality check the NSSDC produced pages and documents.

   WDC-A-R&S will provide a SCID List.

4. **CCSDS Meeting WEB Pages:** Provide Web Pages to communicate information related to CCSDS meetings (such as agendas, logistics information, registration forms, etc.) as requested by CCSDS Secretariat.

   CCSDS Secretariat, MC, TSG, Panels, and hosting agencies are responsible for providing all information to be disseminated such as agendas, logistics information, etc.

   NSSDC will provide non-exclusive operational hardware and software to support HTTP access. NSSDC will create and maintain the system. NSSDC will make changes needed following ADS quality checking.

   If information needed is not supplied directly to NSSDC in a timely manner, ADS will attempt to obtain it. ADS will quality check the NSSDC produced pages and documents.

5. **CCSDS Panel WEB Pages:** Provide access to FTP downloads and Web Pages optionally including feedback forms for the Panels, TSG, MC, and CCSDS Secretariat. The individual panels will dictate content of these pages and groups based on general MC guidelines. Content may include first versions of Red Books not approved by MC for distribution on the CCSDS Pages and even White Books, Concept Papers, and other informational materials may be distributed if approved by the panel or group. Provide good response times and 24 hours per day, 7 days per week access to these pages in same manner as access to the CCSDS pages.

   NSSDC will provide non-exclusive operational hardware and software to support HTTP access. NSSDC will create and maintain the system. NSSDC will make changes needed following ADS quality checking.

   ADS will quality check the NSSDC produced pages and documents.

   Panels and groups are responsible for approving the overall design and content of their portion of the Web Site. Information will normally be transmitted directly by the Panel or Group Chairperson and an appointed representative. Occasionally the information will be sent through the CCSDS Secretariat.

6. **Revise CCSDS pages as needed:** NSSDC will update the CCSDS FTP and Web Sites as appropriate. NSSDC will inform ADS of major changes on a regular basis. These updates are governed by local operating policies. Briefly these are:
   - Updates to lists such as CCSDS memberships, MACAO addresses, etc. will be handled by NSSDC as updates are provided. NSSDC will pass on membership updates, as appropriate, to ADS for incorporation into other lists.
   - Corrections, minor formatting changes, etc. will be handled by NSSDC.
   - Major updates to CCSDS home page must be approved by MC. Normally these will be communicated through the CCSDS Secretariat and the ADS. If they are not communicated through ADS, NSSDC will inform ADS of the updates on a regular basis. NSSDC will support ADS in making proposed changes visible to the CCSDS Secretariat and MC.
   - Major updates to Panel or Group pages must be approved by the appropriate Panel or Group. Occasionally these will be communicated through the CCSDS Secretariat and the ADS. Often they will be communicated by the Panel or Group

Chairperson. If they are not communicated through ADS, NSSDC will inform ADS of the updates on a regular basis.

- NSSDC may periodically suggest updates to the pages. ADS will approve those updates as appropriate, or will forward them to MC either through the CCSDS Secretariat or via the NASA Agency Representative.
- ADS may periodically suggest updates to the pages. ADS will communicate all update suggestions to NSSDC. ADS will seek CCSDS consensus with these suggestions and subsequently seek MC approval if needed.
- Others either within CCSDS or from outside CCSDS may have suggestions related to the CCSDS FTP and Web Sites. When such comments are received they will be forwarded to both ADS and CCSDS Secretariat to be addressed in accordance with above procedures. If appropriate, the update suggestions will be forwarded to MC with NSSDC and ADS comments for approval.

7. **User Comments:** Respond to user comments, in a coordinated way, whether received by e-mail or HTTP form submission. Responses to problems will be prioritized by responding first to NASA space agency related customers, then other space agency customers, and then other users, as necessary. References to a CCSDS WEB FAQ and other resources for problem resolution will be made whenever possible.

   NSSDC will respond to problems in accessing the documents and pages. NSSDC will distribute questions to an ADS approved distribution list. NSSDC will handle P2 related questions and referrals. NSSDC will prioritize its responses as given above.

   ADS will respond to issues of overall organization, CCSDS secretariat issues, etc. ADS will respond to P1 and P3 related technical issues and make the appropriate referrals in coordination with NSSDC. ADS will prioritize its responses as given above.

8. **CCSDS Internal WEB Pages:** Provide a set of (internal) Web Pages that are available for CCSDS, Panel, and Groups to communicate information that is not available to the general public. The only security needed is that these pages are not directly linked to the publicly available pages and the are not registered by NSSDC or ADS with any of the Internet search engines.

   NSSDC will provide non-exclusive operational hardware and software to support HTTP access. NSSDC will create and maintain the system. NSSDC will make changes needed following ADS quality checking.

   ADS will provide limited (due to non-public nature) quality checking of the NSSDC produced pages and documents.

   Panels and groups are responsible for the content of their portion of the internal Web Site. Information will normally be transmitted directly by the Panel or Group Chairperson and an appointed representative. Occasionally the information will be sent through the CCSDS Secretariat.

9. **CCSDS FAQ:** If appropriate, prepare a set of frequently asked questions and responses and update as needed.

NSSDC will prepare and update the FAQ based on the questions received. NSSDC will supply questions and responses for any P2 or CCSDS Web access related technical issues.

ADS will provide general input and suggestions for the FAQ. ADS supply questions and responses for any P1, P3, TSG, MC, or Secretariat related technical issues.

10. **WEB Search Engines:** Periodically review pointers to the CCSDS public site from Web search engines and related organizations. Provide updates to the services when pointers are found to be missing or broken.

    NSSDC will periodically review access to the CCSDS public sites via the major Web Search Engines. NSSDC will provide updates when problems are identified. NSSDC will follow up as appropriate to verify that updates are made. However, NSSDC does not have control over these resources and cannot guarantee the appropriate updates will actually be made.

    ADS will also monitor access to the CCSDS public sites via Web resources. If ADS identifies problems, ADS may either send in updates or may ask NSSDC to follow up

11. **Monthly Report:** Prepare a monthly report, with statistics, and make available via HTTP.

    NSSDC will prepare this based on readily available server statistics. However, it is expected that some special requests will be received from the CCSDS Secretariat and these will take additional effort.

    ADS's only responsibility in this function is general oversight.

12. **NASA Policy and Security:** Maintain awareness of generally accepted government and Internet community practices by attending meetings of Internet related groups (such as Federal Webmasters, GSFC Webmasters, and SIGWWW) and attend other training as appropriate. Maintain the site in conformance with GSFC and NASA policies on Web content and security. Interact with other NSSDC personnel to maintain CCSDS FTP and Web site in harmony with other NSSDC hosted sites.

    NSSDC will participate in appropriate meetings and training when possible.

    ADS's only responsibility in this function is general oversight.

B. DELIVERABLES AND SCHEDULES

Part 1

The contractor shall prepare monthly progress reports, and support occasional technical progress meetings. The contractor shall deliver the following items:

1. NASA CA Annual Report: Produce a NASA CA Annual report using information from the NSSDC, JPL, and UARS MACAOs. Use the CARDS document in this process and produce the report in conformance to CCSDS standards, including delivery dates. Due annually in accordance with the CCSDS CA standard.

2. CA Agent Annual Report: Produce the CA Annual Report as per the CA Procedures standard, including delivery date. This will require collecting information from ESA and CNES. Due annually in accordance with the CCSDS CA standard.

3. Maintain and update the 'CA Configuration File' that may be used by an application to establish electronic communication with each international CA office, and include the NSSD CA office contact information. Due, at a minimum, semi-annually following each CCSDS Panel 2 workshop.

4. Provide improved WEB access to description dissemination and add WEB access for description registration. Due June 1999.

5. Provide NSSD CA office electronic access to descriptions, as described the the CA Configuration file, so that an application that encounters the universally unique ADID can request and receive the corresponding description without human intervention at the NSSD CA office. Due July 1999.

6. Provide and maintain WEB pages on the US and ISO/CCSDS archiving workshops, including forms for registration in the process, in a timely manner related to each workshop. Due within a week following each workshop.

7. Complete the Information Product Creator prototype which gathers files and information from distributed systems and creates a single SFDU object that may be used for archival storage in NDADS or elsewhere. Demonstrate this prototype and upgrade it as requested by NSSDC. Initial demonstration due by 10 January, 1999.

8. Provide WEB page support to the 'Formats Evolution' process with organization and operation proposals, and updates to the pages, on a timely basis. Initial proposals due 7 January, 1999.

Part 2

1. Monthly statistics	Monthly
2. Web page and document updates	As needed to be responsive
3. Respond to comments	As needed to be responsive
4. Frequently Asked Questions, if needed	Jan 30, 1999 and June 30, 1999

GODDARD SPACE FLIGHT CEN R

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon STX Corporation	98156	
	TASK ASSIGNMENT NO. 307	JON: 633-216-03-01-01

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
J. R. Thieman	633 6-9790	J. H. King	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of the Sun-Earth Connection Education Forum (SECEF) task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens

SIGNATURE OF CONTRACTING OFFICER

August 12, 1999

DATE

Mary V. Stevens
Contracting Officer

TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-48 (7/71)

SUN-EARTH CONNECTION EDUCATION FORUM (SECEF)

The non-personal services required under this task are indicated below.

- Provide administrative support of the SECEF managers including assistance in the preparation for education and outreach events; tracking of the progress of the main tasks being performed at GSFC; preparation of monthly reports; communicating and coordinating with University of California, Berkeley counterparts in key Forum activities; and helping to publicize the forum and disseminate education and outreach materials.

- Seek opportunities to "leverage" the activities of the SECEF for broad national impact by working with regional broker/facilitators; coordinate with other ongoing groups or programs in the education/outreach community to spread SECEF products and programs throughout the "educational ecosystem"; search for existing or new products or programs that could be utilized or adapted for utilization in the SEC education/outreach efforts; identify Sun-Earth Connection educational products and programs in the resource directory.

- Assist in the publicity for the SECEF and in the dissemination of SECEF materials to educators and the general community; look for opportunities to make SECEF activities widely known; work with the press and multimedia specialists to enhance the impact of SECEF advertising, news releases, etc.; update and maintain the SECEF website; assure written materials associated with SECEF activities are of high quality and are attractive to the audience for which they were intended; evaluate SEC products and programs to provide effective educational materials and activities for the community.

- Perform other related activities as required.

- Prepare and disseminate adequate and timely documentation concerning the activities performed in satisfying the requirements of this task, including:

  - report of monthly progress,
  - report of achievements to the technical monitor as they occur,
  - preparation of special reports concerning the tasks as required by the Government.

The contractor may need to travel in accomplishment of portions of these tasks.

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	98156
	Task No. 308 JC JON: 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
W. M. Lawson	631 6-3431	R. L. Pisarski	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Data Systems Development task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through ~~November 30, 1999~~ May 20, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens
Contracting Officer

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	8/12/99	

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Data Systems Development Task

The NSSDC manages a great deal of data, offline in deep archives and as inventories of CD-ROMs, nearline as data files on NDADS, and online both as FTP-accessible files and as files subsettable by time and parameter in systems such as CDAWeb and OMNIWeb, discussed elsewhere. To support these, NSSDC defines evolving data volume, access, and performance requirements, and applications systems must be defined, developed, made operational, and evolved in order to meet the requirements.

Current examples of data management software include the NDADS-relevant SOAR, ARMS, and FST software, the offline-relevant Interactive Data Archive (IDA) database and its interfaces, and other software utilities. The contractor shall support the process of defining evolving requirements, and shall play key roles in defining and developing evolving software systems for satisfying the requirements. The contractor shall assist in the defining of an optimally integrative system and interface providing management of and user access to the multiplicity of NSSDC-managed offline and network-accessible data and other information services.

- Prepare a plan for the evolution of NSSDC systems. The system evolution plan should take into account the latest developments in information system technology, including mass storage device technology, World Wide Web technology, and other key information system technologies. The plan should focus on strategies that allow the NSSDC to maintain leading-edge competencies and capabilities while satisfying customer requirements.
- Perform a requirements analysis and prepare a requirements definition that supports the evolution of NSSDC system architectures and capabilities to meet increasing customer demand. Requirements analysis should focus on both internal system needs driven by evolving technologies and data volumes, and external interface needs driven by customer functional requirements.
- Prepare an integrated system architecture that encompasses all NSSDC systems and requirements and provides flexibility to allow system expansion and evolution as needs change and grow. The system architecture should include separate designs for system utilization, network architecture, COTS software architecture, and information architecture.
- Prepare an implementation plan, with incremental releases, that follows the system evolution plan, satisfies the requirements definition, and implements the system architecture designs.
- Develop an integrated data model for NSSDC data and metadata.
- Prepare a configuration management plan and implement configuration management for all system components.
- Develop application software within the framework of the system architecture, the implementation plan, and the integrated data model.
- Provide sustaining engineering for all system components.

- Update system evolution plan, requirements definition, and system architecture as needed and modify implementation plan, data model, system configuration, and application software accordingly.

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

May 21, 1999

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Order Number 308

Task Order Number 308 "Data Systems Development" is hereby cancelled and replaced by Task Order Number 308a which is also titled "Data Systems Development".

You are required to submit a task plan for this revised task order within fifteen days. The task plan shall include the following:

a) The technical approach to accomplishing the task order;

b) Comments on the intended period of performance;

c) Information detailing the expected cost of completing the task order, including a recommended NTE;

d) Any other information which you deem necessary.

Upon review of the task plan and any necessary discussions, the Government may issue a task order for the enclosed task.

If you have any questions regarding the above, you may contact me at 301-286-6993.

Mary V. Stevens
Contracting Officer

Enclosure

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-
Raytheon STX Corporation	~~XXXXX~~ 98156
	Task No. 309 JC JON: 633-332-17-10-07

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
Barry Jacobs	633 6-5661	J. H. King	J. L. Green 6/30/1999

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of the Electronic Handbook Development task.

b. SCHEDULE OF PERFORMANCE

December 1, 1998 through November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
Mary V. Stevens	August 12, 1999	Mary V. Stevens Contracting Officer

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Statement of Work

Electronic Handbook Development Task

The objective of this task is to provide ongoing support for the development of an Electronic Handbook for managing processes/subprocesses.

The following subtasks have been identified as items to be supported through this task:

1. Develop World Wide Web (WWW) Menus: The scope of this subtask deals with the development of WWW menus corresponding to all of the RND processes/subprocesses.

2. Develop WWW Database/Report Tool Forms: The scope of this subtask deals with the development of WWW forms corresponding to all of the RND Database and Report Tools processes/subprocesses.

3. Identify gaps between WWW Report Tools and Database Forms: The scope of this subtask deals with the identification and repair of gaps between report tools and the database forms needed to support the collection of data to support the report tools.

4. Develop Database/Report Tools Processes/Subprocesses Instructions: The scope of this subtask deals with the development of WWW instruction files corresponding to RND Database and Report Tools processes/subprocesses.

5. Implement Database/Report Tools Processes/Subprocesses: The scope of this subtask deals with the collection/implementation of WWW files corresponding to the forms, instructions, relevant data, email instructions, and archives corresponding to RND Database and Report Tools processes/subprocesses.

6. Deliver Database/Report Tools Processes/Subprocesses: The scope of this subtask deals with the transfer and test of the operational system to a platform devoted to RND Database and Report Tools processes/subprocesses.

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

August 17, 1999

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Assignments

In accordance with Contract Clause C.4 "Task Assignments and Reports (Applicable to CLIN 2)," enclosed is a fully executed copy of Task Assignment 310. As required by Clause C.4, please submit the Contractor Task Report, for this task, concurrent with the next monthly report called for by the contract.

Please acknowledge receipt of this Task Assignment by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

Mary V. Stevens
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Julie Smith 8/19/99
Signature Date

Julie Smith
Name

GODDARD SPACE FLIGHT CENTER
TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon ITSS Corporation	98156	
	TASK ASSIGNMENT NO. 310	JOB ORDER NO. 633-332-17-10-04

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
Barry Jacobs	633 6-5661	J. H. King 8/6/99	J. L. Green

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of NASA Education Program Data Collection and Evaluation System (EDCATS) task.

b. SCHEDULE OF PERFORMANCE

~~August 2, 1999 through November 30, 1999~~

July 5, 1999 through November 5, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens
Contracting Officer

Mary V. Stevens — AUG 19 1999

SIGNATURE OF CONTRACTING OFFICER | DATE | TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GFC 18-48 (7/71)

NASA Education Program Data Collection and Evaluation System (EDCATS) Task

The contractor will provide engineering support for the continued implementation of the NASA Education Program Data Collection and Evaluation System (EDCATS, also referred to as the NASA Education Evaluation System). This system is being developed to satisfy the Agency's program evaluation requirements with a cost effective, reliable and secure approach.

The contractor will be responsible for:

- Implementing support for new programs including data collection forms, pre-defined reports, and agency-wide rollup reports.
- Developing procedures and scripts to facilitate the process for FY transition and archiving.
- On-line, phone, and in-person help desk support.
- Providing customized training to NASA HQ and Field Center staff when requested.
- Administering and maintenance of user accounts for system access.

GODDARD SPACE FLIGHT CENTER

TASK ORDER

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
Raytheon ITSS	NAS5-98156	633-370-28-30-01

4. JOB ORDER NO./PROJECT:	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE) : ___ YES ___ NO	6. DESIGNATED FLIGHT ASSURANCE MGR.:

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED) :

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

See attached.

TASK ORDER NUMBER: 312

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

See attached.

9. PERFORMANCE/MILESTONE SCHEDULE: 05/12/00 - 11/30/00

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:

James L. Green/630/6-7354

14. BRANCH APPROVAL:

15. DIVISION CONCURRENCE:

James L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE:

Roger L. Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

MAY 12 2000

Mary V. Stevens

CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens

TYPED OR PRINTED NAME

Analysis support for the IMAGE Mission

Introduction:
The application of remote sensing techniques has a high potential of obtaining unprecedented space weather related data on the dynamics of storm and substorm processes and in particular determining the relationship between a variety of global phenomena. The Imager for Magnetopause-to-Aurora Global Exploration (IMAGE) mission has an impressive array of remote sensing instruments which will image a number of important phenomena such as the auroral zone, the geocorona, the ring current, the plasmasphere, auroral ion fountain, and the magnetopause on a time scale of 5 minutes or less. IMAGE is in a polar orbit with apogee of about 8 Earth radii (geocentric radial distance) where it is situated to observe the structure and dynamics of the magnetospheric boundaries during geomagnetic storms.

1. **Installation and update of IMAGE standard software suite** - The IMAGE team is developing a suite of standard software that will be used to analyze and display all 8 instruments on IMAGE satellite. The standard formats for IMAGE are the Universal Data Format (UDF) and the Common Data Format (CDF). The standard software packages can read UDF, CDF, and Level 0 IMAGE data. Early on in the mission it is expected that new and updated software shall be installed on all the key SSDOO IMAGE analysis machines regularly.

2. **RPI data analysis** - The contractor shall develop specialized software that will reduce and analyze RPI data into well defined, well-calibrated products useful to the RPI team and the science and educational communities. Such products are key to demonstrating the importance and success of the IMAGE mission. In addition, the contractor shall develop a variety of visualization techniques for RPI data in order to take advantage of its multi-dimensional nature. Software will be developed using primarily JAVA, C++, and IDL languages and conform to the IMAGE standard software suite and documentation. The contractor shall also write and maintain the appropriate documentation for this function (including software documentation).

3. **Correlative data analysis and visualization** - Specialized analysis and visualization software shall be developed by the contractor which will enable the IMAGE scientists to combine a variety of data sets from other instruments not only on IMAGE but other correlative missions (e.g.: Wind, Polar, Geotail, Cluster). The contractor shall also write and maintain the appropriate documentation for this function (including software documentation).

4. **Space Weather Analysis** - The activities under this area are to provide support for the synthesis of theories and data describing the dynamics of various regions of the Earth's magnetosphere. The prime set of data will be from the IMAGE mission. This effort should enable the creation of a comprehensive database providing unique space weather data products and services. The contractor shall

also write and maintain the appropriate documentation for this function (including software documentation).

5. **IMAGE Science Center (ISC) Web site support.** - The activities under this area are that the contractor shall maintain the existing GSFC IMAGE web pages, perform appropriate updates and improvement, and redesign the site as necessary implementing new features in a timely manner.

GODDARD SPACE FLIGHT CENTER

TASK ORDER

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
Raytheon ITSS	NAS5-98156	00-313-00

4. JOB ORDER NO./PROJECT:	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE) :	6. DESIGNATED FLIGHT ASSURANCE MGR.:
696-622-96-03-78	___ YES X NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED) :

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

See attached for detailed task description for Community Coordinated Modeling Center.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

See attached.

9. PERFORMANCE/MILESTONE SCHEDULE: Period of performance: 10/16/00 through 11/30/00

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

12. OTHER (FUNDING, NTE, HOURS, ETC.):

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:
Michael Hesse/696/x6-8224

14. BRANCH APPROVAL:
Robert E. McGuire 10/12/00

15. DIVISION CONCURRENCE:
James L. Green 10/12/00

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE:
Roger L. Dilling

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

Mary V. Stevens 10/23/00
CONTRACTING OFFICER'S SIGNATURE/DATE

Mary V. Stevens
TYPED OR PRINTED NAME

GSFC ATR: Dr. M. Hesse, Code 696

Community Coordinated Modeling Center

Background

As part of the Living with a Star Project, this task will provide science and software support for the development and operation of the Community Coordinated Modeling Center (CCMC). Specific support includes developing and testing of simulation codes for space weather models, performing simulations of realistic space weather events, providing visualization and analysis software, performing comparison of modeling results to satellite measurements, and performing original research in space plasma physics.

STATEMENT OF WORK

The contractors will perform theoretical and numerical studies in support of CCMC projects. In particular, this task involves studies required to develop and test simulation codes for comprehensive space weather models. The contractor will support the integration of existing research grade models, as well as perform research in space plasma physics as required to further space weather goals. Efforts shall also include realistic database processing as required to efficiently develop and exercise the models as well as to prepare them for transitioning. Comparison of modeling results to satellite measurements will also be required. The contractor will develop the visualization and analysis software for simulation results and make presentations of results at international conferences and in peer-reviewed journals. The task also includes the development of the CCMC Web site and administration of the CCMC computer network.

Completion of this task will require access to the appropriate computing facilities, data entry/display devices, databases, communication networks, and visualization software within the SSDOO and in the Laboratory for Extraterrestrial Physics. In addition, successful simulations of space weather events are dependent upon cooperation of the data providers and accessing the NSSDC data archive. This data will be assimilated into all the modeling software as appropriate. The data assimilation could potentially include archival data from IMAGE, Wind and Polar.

Deliverables Include:

1) Codes for comprehensive space weather models
2) Visualization and modeling software
3) Simulation managing scripts
4) Web pages
5) Conference presentations
6) Papers suitable for submission to *GRL*, *JGR* or similar peer-reviewed journal.

Period of Performance

Planned Start Date: October 16, 2000
Planned End Date: November 30, 2000

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

May 11, 2001

Raytheon STX Corporation
Attn: Ms. Wanda Neal
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Assignment 01-314-00

In accordance with Contract Clause C.4 "Task Assignments and Reports (Applicable to CLIN 2)", enclosed please find a fully executed copy of Task Assignment 01-314. As required by Clause C.4, please submit the Contractor Task Report, for this task, concurrent with the next monthly report called for by the contract.

Please acknowledge receipt of this Task Assignment by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

James S. King
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Wanda Neal 5/15/01
Signature Date

WANDA NEAL
Name

NASA/GSFC ENGINEERING DIRECTORATE

REQUEST FOR QUOTE/TASK ASSIGNMENT

CONTRACTOR	CONTRACT NO./TASK NO.	JOB ORDER NUMBER FY
Raytheon	NAS5-98156 TASK NO. 01-314	570-019-08-03-10 2001

APPROVALS: TYPE OR PRINT NAME AND SIGN

	DATE	CODE	PHONE
ASSISTANT TECHNICAL REPRESENTATIVE (OR TASK MONITOR) Jennifer M. Bracken Jennifer M. Bracken	30 Apr 2001	571	x3688
BRANCH HEAD Brent Robertson Brent Robertson	5/1/2001	571	x6392
CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR) Roger Dilling Roger Dilling	5/9/01	630	x6412

FLIGHT HARDWARE, CRITICAL GSE OR SOFTWARE? (IF YES, NEED CODE 303 CONCURRENCE NEXT BLOCK) YES NO X	CONTRACTING OFFICER'S QUALITY REP.	DESIGNATED FAM:

DESCRIPTION OF WORK TO BE PERFORMED: (USE BLANK PAPER IF ADDITIONAL SPACE REQUIRED)

[ ] TECHNICAL WORK MAY NOT BEGIN PRIOR TO CTR ACCEPTANCE.

[ ] CONTRACTOR WILL DEVELOP SPECIFICATION OR STATEMENT OF WORK UNDER THIS TASK.

[ ] FLIGHT HARDWARE WILL BE SHIPPED TO GSFC FOR TESTING PRIOR TO FINAL DELIVERY.

[ ] MONTHLY TECHNICAL PROGRESS REPORTS ARE NOT REQUIRED.

[ ] Request for Quote Date:_____ [ ] Cost Task [ ] Fixed Price Task Amount: $_____

STATEMENT OF WORK:

Provide support services to develop the 570/Guidance, Navigation and Control Center's website and to install the site on the GNCC's Sun Solaris web server.

TASK END DATE:

29-Jun-01

Milestones/Deliverables and Dates

Bi-weekly status meetings shall be arranged to monitor progress.

FINAL DELIVERY DESTINATION (NAME, BLDG, ROOM):

Jennifer Bracken, Bldg 11, Rm E109

AUTHORIZED SIGNATURE:

THIS TASK ASSIGNMENT IS ISSUED ACCORDING TO THE CONTRACT CLAUSE "TASK ASSIGNMENTS AND REPORTS"

James S. King

SIGNATURE OF CONTRACTING OFFICER — 5.9.01 DATE — Contracting Officer TYPED NAME OF CONTRACTING OFFICER

CONTRACTOR'S ACCEPTANCE:

N/A

AUTHORIZED SIGNATURE — DATE

GSFC FORM 703-1845 7/96 (OLDER VERSIONS ARE OBSOLETE)

DISTRIBUTION: CONTRACTOR, CONTRACTING OFFICER, TECHNICAL OFFICER, CODE 303, ASSISTANT TECHNICAL REPRESENTATIVE

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

July 11, 2001

Raytheon STX Corporation
Attn: Ms. Wanda Neal
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Assignment 315

In accordance with Contract Clause C.4 "Task Assignments and Reports (Applicable to CLIN 2)", enclosed please find a fully executed copy of Task Assignment 315. As required by Clause C.4, please submit the Contractor Task Report, for this task, concurrent with the next monthly report called for by the contract.

Please acknowledge receipt of this Task Assignment by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

James S. King
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Wanda Neal July 16th, 2001
Signature Date

WANDA M. NEAL
Name

GODDARD SPACE FLIGHT CENTER

TASK ORDER

PAGE OF

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
RAYTHEON	NAS5-98156	315

4. JOB ORDER NO./PROJECT:	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE) : ___ YES ___ NO	6. DESIGNATED FLIGHT ASSURANCE MGR.:

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED) :

☐ CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.

SEE ATTACHED SOW

AUTOMATED VULNERABILITY SCANNING AND REPORTING SYSTEM, DB REPOSITORY AND REPORTING/PUBLISHING SUB-TASK STATEMENT OF WORK

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

SEE ATTACHED SOW

9. PERFORMANCE/MILESTONE SCHEDULE:

SEE ATTACHED SOW

10. QUALITY ASSURANCE REQUIREMENTS:

SEE ATTACHED SOW

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

NONE - TRAVEL

SEE SOW - MATERIALS

12. OTHER (FUNDING, NTE, HOURS, ETC.):

NONE

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:

RICHARD H. SCHNEIDER/630/65543

14. BRANCH APPROVAL:	15. DIVISION CONCURRENCE:
James L. Green	James L. Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

James L. Green for Roger Billing

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE:

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.

James S. King 7/11/01

CONTRACTING OFFICER'S SIGNATURE/DATE

James S. King

TYPED OR PRINTED NAME

Automated Vulnerability Scanning
and
Data Integration/Reporting System

DB Repository and Reporting/Publishing Sub-task
Statement of Work

Overview

The following Statement of Work (SOW) covers a subset of the overall the development of an automated remote control host vulnerability scanning and reporting system. The complete system shall be capable of automating the routine host vulnerability scanning process requiring little or no human intervention and shall include remote and local scanning parameters setup and scan initiation, vulnerability data collection through secure downloads to a database (DB) repository and finally report generation, Web-server posting and availability notification.

The technical effort related to this SOW covers the DB Repository and Reporting System portion of the overall work effort as described in the main Automated Vulnerability Scanning and Data Integration/Reporting System Requirements Document. The SOW covers the integration of COTS software as well as the development of any necessary scripting and SQL query control custom software. The COTS and custom software are expected to reside on multiple Intel/Windows platforms running MS Windows operating systems and associated system and applications software and support secure system configurations and communications interfaces.

Specifically, the system shall be capable of supporting:

1) secure retrieval of vulnerability data from distributed scanning devices,
2) ingest and integration of scanning device data sets into a centralized database storage in support of archiving, trend analysis, and reporting,
3) generation of both low (host-detailed) and high (subnet) level vulnerability reports, and
4) posting of static vulnerability reports and production of user-selectable dynamically generation vulnerability reports on a limited access Web server, and
5) electronic notification to Computer Security Officers (CSOs) of the on-line availability of reports.

Work Description

This SOW only applies to the development of the DB Repository and Reporting/Publishing Subsystem which includes the three listed functions. The DB Repository and Reporting/Publishing Subsystem is one of three subsystems (vulnerability Scanning, Remote Control, and DB Repository and Reporting/Publishing) comprising the overall Automated Vulnerability Scanning and Data Integration/Reporting System.

- DB integration and storage (repository)
- Reporting
- Publishing

The following addresses the overall work elements associated with the implementation of these functions:

- Data analysis to identify, verify, and validate the DB Repository and Reporting/Publishing Subsystem requirements and needs in an effort to gain a detailed understanding of the strategic and operational objectives and identify specific goals. This shall be accomplished through data collection, interviewing subject matter experts, reviewing existing system documentation, and examining existing manual and automated processes. The system requirements shall focus on data, functions, business rules, security, and integration of the application and identify what and how the system should perform. Specifically, the requirements shall focus on data retrieval, data integration, data storage, DB querying, and dynamic and static reporting

- Mapping of the three functional areas to hardware and software elements or subsystems and associated specification and purchase (if required, not to exceed $10K) of Intel hardware components (laptops, workstations, servers) and COTS software products

- Installation of operating systems and other system software products on the (mostly GSE) Intel platforms including the integration of Windows NT/20000 with other COTS products

- Replication of the existing MS Access-based IVDRS system functionality to a SQL Server based DB system including the IVDRS capabilities to integrate scanning devices' DBs, perform data roll-up, produce static vulnerability reports, perform vulnerability filtering, etc.

- Expansion of the current static vulnerability reporting capability to include:
  - -- dynamic reporting allowing users to select DB (fields) parameters for reporting and sorting
  - -- high to low-level vulnerability data drill down
  - -- security in the form of limit access to reports and associated parameter ranges based on user organization and roll

- Pre-deployment piloting and integration testing of the DB Repository and Reporting/Publishing Subsystem

Deliverables

The contractor shall provide the following as indicated:

- Bi-weekly progress reports

Documentation in the form of a report delivered every two weeks displaying current status, issues, salient plans, any delays and/or unexpected roadblocks and financial status of the project.

- DB Repository and Reporting/Publishing Subsystem

Installed and fully functional DB Repository and Reporting/Publishing Subsystem and its integration with the overall Automated Vulnerability Scanning and Data Integration Reporting System as defined in the Automated Vulnerability Scanning and Data Integration Reporting System Requirements Document.

- Requirements Testing

Perform testing against the functional requirements as listed herein. Generate the test plan and associated test reports which shall demonstrate compliance with the requirements and indicate

any discovered discrepancies – An initial delivery shall be 4 months after start of task, with the full capability delivery no later than 7 months after start of work.

- **Documentation**

Technical documentation which reflects the COTS products setup and system integration and custom software processing flow related specifically to the requirements implementation - Completion is no later than 7 months after start of activities.

Period of Performance

The period of performance of this effort is a maximum of 7 months.

Place of Performance

The individual(s) performing the activities outlined herein will be located in Building 26 at the Goddard Space Flight Center, Greenbelt Rd, Greenbelt Maryland 20771. All appropriate workspace, desk(s), equipment (hardware and software), and supplies will be GFE (NASA).

Technical Skills Required

The following is a non-exhaustive list of the technical skills required of the technician(s) to implement this SOW:

General:

- Installation and checkout of various COTS products on multiple Windows workstation and sever platforms
- Systems integration and testing of multi-vendor products

Specific hands-on experience required:

- Windows NT Workstation/Server and/or Windows 2000 (Server and Professional) and associated Windows Scripting Host
- Web servers and Web content development
- MS Internet Information Server (IIS)
- MS SQL Server and associated DB design
- Web Server Secure Sockets Layer (SSL) protocol and associated digital authentication certificates
- Crystal Decisions Reports and associated Web server capability

Additional knowledge (desirable):

- At least one scripting language (i.e. JavaScript)
- Structured Query Language (SQL)
- MS Access
- MS IIS Active Server Pages (ASP)

A tomated Vulnerability Sca ing
and
Data Integration/Reporting System

Requirements Document

Overview

The following functional and system requirements cover the development of an automated remote control host vulnerability scanning and reporting system. The system shall be capable of automating the routine host vulnerability scanning process requiring little or no human intervention and shall include remote and local scanning parameters setup and scan initiation, vulnerability data collection through secure downloads to a database (DB) repository and lastly report generation, Web-server posting and availability notification.

Specifically, the system shall be capable of supporting:

1) Remote control of local strategically placed and geographically distributed vulnerability scanning devices,
2) uploading scanning control scripts and setup files to the scanning devices,
3) scanning devices which control the actual host vulnerability scanning process and initial data collection utilizing multiple scanning tools,
4) secure retrieval of vulnerability data from distributed scanning devices,
5) ingest and integration of scanning device data sets into a centralized database storage in support of archiving, trend analysis, and reporting,
6) generation of both low (host-detailed) and high (subnet) level vulnerability reports,
7) posting of static vulnerability reports and production of user-selectable dynamically generation vulnerability reports on a limited access Web server, and
8) electronic notification to end-users of the on-line availability of reports

Background

The NASA Principal Center for IT Security (PCITS) requires each Center to perform comprehensive penetration testing vulnerability scans each quarter. All Centers are presently employing a common set of scanning tools to test for and report on host vulnerabilities. At Goddard Space Flight Center (GSFC) in Greenbelt, Maryland including its subordinate facilities (GISS, WFF, and IVV in New York City, Virginia, and West Virginia respectively), the approach taken is that of a hybrid method involving centralized scans as well as distributed scans in cases were it is necessary to locate the scanning devices behind select firewalls and routers thereby facilitating the uncovering all potential vulnerabilities on each host. Due to the geographic dispersion of the Centers and the current methodology employed, current scanning and associated report generation and distribution methods has proven to be very labor intensive and time consuming. Because of this, GSFC has experienced difficulty in meeting the requirement for periodic multiple scans and reporting and thus seeks a more end-to-end automated approach to vulnerability data collection and reporting.

Functional and System Requirements

- Automated Vulnerability Scanning and Data Integration/Reporting System

The following defines the overall functional requirements as well as the more detailed functional and system requirements.

Overall Functionality Requirements	The overall capability shall provide an end-to-end automated vulnerability scanning system consisting of strategically placed scanning devices, supported by services such as remote control, DB repository and reporting/publishing. The system shall be capable of utilization within all GSFC facilities (GSFC, GISS, WFF, IVV) and as well as replication across NASA Centers.
Vulnerability Scanning	Vulnerability scanning shall be provided by scanning devices capable of running a main scanning tool supplemented by other secondary or supporting scanning tool applications. The scanning process shall be capable of being automated with external control originating from the Remote Control service.
Remote Control	The Remote Control function shall serve to download and collect the vulnerability data from the remote scanning devices. It shall provide a means of defining scanning device executable scripts capable of controlling the scanning process. The Remote Control service shall also provide a convenient interface capable of assigning scripts to specific scanning devices and provide a means of uploading the scripts to the devices. Both uploading and downloading shall be over secure communication links.
DB Repository and Reporting/Publishing	The DB Repository and Reporting/Publishing service shall provide vulnerability scanning data integration, analysis, and archival storage. It shall also provide a limited access secure Web server function for the production and electronic distribution of low (host specific) level technical and high (subnet) level managerial reports.
Detailed Functionality and System Requirements	The overall functional requirements shall be mapped into hardware and software subsystems and utilize custom developed software to integrate the required subsystem services
Vulnerability Scanning	Scanning devices shall be comprised of an Intel-based PC or laptop computer operating under the Windows 20000 Professional OS and configured to run at a minimum Internet Security Systems (ISS) Internet Scanner (IS). Other COTS, Shareware or Freeware scanning tools such as FScan (Foundstone, Inc.) and nmap shall also reside on the system within the limits of the scanning device configuration
	All vulnerability scanning results shall be saved in a MS Access based Integrated Vulnerability Database and Reporting System (IVDRS) compatible standard format and downloaded to the Remote Control service on a scheduled or adhoc basis. (IVDRS was recently custom developed at GSFC)
	Capability to run COTS remote control software and execute a scripting language, such as VBScript, using the Windows 2000 resident scripting host (SSH) and Distributed Component Object Model (DCOM) client/server capability
	Capability to communicate with the Remote Control Server using NASA facilities Intranets and the commercial Internet using a VPN and IPSec secured communications path able to transcend or negotiate any in place Center firewalls
	Capability to receive scanning control scripts from the Remote Control service
	Capability to execute a scripting language to:
	- start a scheduled or adhoc scan

	- scan for selectable vulnerabilities and IP ac ss ranges using ISS IS and other scanning tools such as FScan and nmap
	- control via the command line, the setting of the parameters of the Internet Scanner (including other scanning tools) such as the vulnerability policy utilized, the IP address range to scan and if possible (for example by using the MS Scriptlt utility), the number of parallel scanning threads and parallel service scans to use and the option to "Scan if the Ping Fails and Always Run Exploits" modes
	- reset or initialize the ISS IS Access DB file at the start of a scanning period
	- perform pre-main scan host discovery scans in support of subsequent ISS IS scans in the "Scan if Ping Fails" and Run Exploits" modes
	- utilize scanning tools (i.e. FScan, nmap, etc.) other than IS for the purpose of supplementing IS capabilities, obtain OS identification, etc. in support of executing specially tailored or more comprehensive scans against selected (i.e. mission critical servers, servers residing outside the Center firewall, selected OSs, etc.) network devices thereby avoiding selected host devices in an effort to reduce scanning induced adverse impacts and network traffic, speed up the scanning process, and reduce false positives
	- perform scans from start to finish with little or no human intervention required
	- penetrate router, host and firewall ICMP and other common types of filtering as much as is possible in an effort to communicate with each active host
	- send a notification of scan completion to the Remote Control service
	- send an E-mail notification of scan completion to selected recipients
	- indicate the type of scan completion (normal or controlled abort)
Remote Control	*Remote Control function shall have the capability via a GUI to:*
	- support user definable remote scanning devices
	- communicate with the Remote Control service using NASA/GSFC Intranets and the commercial Internet using a VPN and IPSec secured communications channel able to transcend any in place Center firewalls
	- encrypt all scanning device DB data sets before download to Remote Control Unit
	- de-encrypt all scanning device DB data sets after download to Remote Control Unit
	- on a scheduled or ad hoc basis download the MS Access DBs residing on the remotely (geographically dispersed) and locally distributed scanning devices.
	- utilize Microsoft (MS) Windows 2000 Server and appropriate (TBD) COTS remote control software
	- control the scanning devices either in "real time" or on a scheduled basis
	- allow authorized operator workstations to logon remotely over a secure connection to the Remote Control service itself
	- create, modify, and upload scanning control scripts to the scanning devices
	- create or modify scan schedules
	- pause and restart vulnerability scans (all or selectively) prior to the scan's normal completion.
	- terminate (abort) vulnerability scans (all or selectively) prior to the scan's normal completion.
	- monitor scanning progress for completion and any problems (for example, ISS IS hangs)
	- Securely communicate with and transfer collected vulnerability data to the DB Repository and Reporting service.
	- upload specific IP address scanning range keys (in the case of ISS Internet Scanner) or other configuration control parameters to selected or all scanning devices
	- upload to scanning devices scanning parameters such as specific IP addresses (or ranges) and selective vulnerability checks (known as "Vulnerability Policies" in the ISS IS system).

	- support the up-to-date mainten[illegible] and proper configuration of the scanning devices' scanning tools and Windows 2000 OS (including Registry) with the latest Service Pack and associated hot-fixes and scanning tools.
	- install the latest ISS Internet Scanner (IS) software version and associated X-Press (vulnerability checks) updates
	- exit and re-load the ISS IS and other scanning tools software
	- re-boot the scanning devices' OS
DB Repository and Reporting/Publishing	*The DB repository service shall:*
	- provide a long term on-line and off-line data storage repository/archive for all collected vulnerability data and generated vulnerability reports
	- integrate the MS Access (ISS Internet Scanner) DBs vulnerability data collected and downloaded from the remote vulnerability scanning devices with the composite SQL Server DB
	- utilize MS SQL Server as the IVDRS compatible DBMS
	- provide a secure communication path with the remote control and reporting services
	The reporting and publishing service shall provide the capability to:
	- automatically process collected DB vulnerability data and generate static (canned/fixed) low and high level vulnerability reports for end-users (system administrators) and Center/security managers respectively as follows: -- low (host) level reports similar to those currently provided by IVDRS such as (but not limited to): --- Host Assessment/Reachability/ICMP Filtered Status --- Host Vulnerabilities (Detailed and Overview) Found --- Host Vulnerabilities Trend (over multiple reporting periods) --- Host Services Found -- high (subnet) level reports similar to the format and content of the reports provided by IVDRS
	- generate dynamic reporting including high to low level details drill down (from a higher to a lower data set) capability supporting end-user definition of report content through the selection of vulnerability types, subnet(s), host IP address(s), sorting parameters and the Goddard LAN network (CNE, Mission, GITT, WFF, IVV, or MAN) reported on.
	- perform vulnerability filtering (removal) as implemented in IVDRS for specific vulnerabilities and for specific hosts requiring vulnerability corrective wavers
	- support Web server limited access rights to vulnerability data reports with a granularity that supports end-user roles and responsibilities.
	- generate e-mail based notification messages to report recipients indicating the availability of vulnerability reports posted on the secure Web server.
	The reporting and publishing service shall utilize the MS Internet Information Server (IIS) including Active Server Pages (ASP) as the limited access secure Web server and configure a secure server utilizing (among other protective measures) client IP address filtering and SSL including client authentication.
	The reporting and publishing service shall utilize the current version of Crystal Decisions Reports reporting and Web server capabilities in support of the production of both statically generated and end-user definable dynamically generated low level (SAs) and high level (managerial) vulnerability reports

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 210.8

October 16, 2002

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Order Cancellation

As indicated below, the following Task Order is cancelled:

Task Number	Title	Effective Date of Cancellation
315	Automated Vulnerability Scanning and Reporting System	10/16/02

Please acknowledge receipt of this cancellation by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

James S. King
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Julie Smith 10/21/02

Signature Date

Julie Smith

Name

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

November 1, 2001

Raytheon STX Corporation
Attn: Ms. Wanda Neal
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Assignment 316

In accordance with Contract Clause C.4 "Task Assignments and Reports (Applicable to CLIN 2)", enclosed please find a fully executed copy of Task Assignment 316. As required by Clause C.4, please submit the Contractor Task Report, for this task, concurrent with the next monthly report called for by the contract. Please note that this task's duration presumes the exercise of Option 2 of the contract.

Please acknowledge receipt of this Task Assignment by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

James S. King
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Wanda Neal 11/6/01

Signature Date

WANDA M. NEAL

Name

GODDARD SPACE FLIGHT CENTER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon ITSS	98156	
	TASK ASSIGNMENT NO. 316	JOB ORDER NO. 691-624-05-51-25

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
J. Nuth	691 6-9467	J. Nuth	R. Vondrak/690

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

SiO Cluster Distributions and Oxygen Isotopic Fractionation in the Primitive Solar Nebula

-task description attached-

*cancelled on 11-30-02 JSK

b. SCHEDULE OF PERFORMANCE

11-01-01 - 10-13-02

COTR Approval: Roger Dilley 10/31/01

Nancy Laubenthal for
Dr. James Green
6-7354

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER
James S. King	11/1/01	James S. King, Contracting Officer

Contractor-Copy No. 1

GSFC 18-45 (7/71)

NSSDC SUPPORT SERVICES
CONTRACT NAS5-98156

TASK #: 316 **JON:** 691-624-05-51-25

ATR: J. Nuth (Code 691) **POP:** 11/1/01 to 10/31/02

SiO Cluster Distributions and Oxygen Isotopic Fractionation in the Primitive Solar Nebula

The purpose of this task is to analyze the cluster distributions obtained using the Molecular Beam Apparatus located at the Pennsylvania State University at College Station Pa. The system is located in the laboratory of Dr. H. W. Castleman and has produced a unique data set on the cluster distribution of SiO clusters produced by partial condensation following laser evaporation. Future experiments will concentrate on extending these basic experiments to isotopically labeled systems using pure ^{28}Si and enriched oxygen isotopes. These experiments are highly relevant to the origin of oxygen isotopic anomalies in the early solar nebula and present a very complex analytical problem.

WORK ELEMENTS

100 Analysis of the SiO Cluster Distribution – normal Si & O

200 Analysis of the SiO Cluster Mass Distribution using Pure ^{28}Si and normal O

300 Analysis of the SiO Cluster Mass Distribution using Pure ^{28}Si and enriched O

400 Dissemination of results

METRIC EVENTS

101 Complete Table of cluster masses and relative abundances – normal Si & O

Completion (final form):December 31, 2001.

102 Complete Draft Manuscript describing these results.

Completion (final form): January 30, 2002.

103 Submit manuscript for consideration of publication

Completion: February 28, 2002.

201 Begin analysis of SiO Cluster Mass Distribution using Pure ^{28}Si and normal O

Completion: April 30, 2002.

202 Complete Draft Manuscript for SiO Cluster Mass Distribution using Pure ^{28}Si and normal O

Completion: June 30, 2002.

301 Begin analysis of SiO Cluster Mass Distribution using Pure ^{28}Si and enriched O

Completion: July 30, 2002.

302 Complete Draft Manuscript for SiO Cluster Mass Distribution using Pure ^{28}Si and enriched O

Completion: September 30, 2002.

401 Present task results at Annual Meeting of the Meteoritical Society:

Completion: August, 2002

402 Submit one or more publications on task results to JCP, MAPS or similar journal:

Completion: October 30, 2002.

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

June 5, 2002

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Assignment 317

In accordance with Contract Clause C.4 "Task Assignments and Reports (Applicable to CLIN 2)", enclosed please find a fully executed copy of Task Assignment 317. As required by Clause C.4, please submit the Contractor Task Report, for this task, concurrent with the next monthly report called for by the contract.

Please acknowledge receipt of this Task Assignment by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

James S. King
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Julie Smith 6-10-02

Signature Date

Julie Smith

Name

GODDARD SPACE FLIGHT CENTER

TASK ORDER

(INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR:	2. CONTRACT NO.:	3. TASK/REVISION NO.:
Raytheon	NAS5-98156	317

4. JOB ORDER NO./PROJECT:	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE) :	6. DESIGNATED FLIGHT ASSURANCE MGR.:
	___ YES X NO	

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED) :

☐ **CONTRACTOR WILL DEVELOP STATEMENT OF WORK OR SPECIFICATIONS UNDER THIS TASK.**

Polar/Wind/Geotail VMS software conversion, setup, and testing

Given the base software from an operational facility at NASA GSFC, convert the following to run within a completely automated system on another VMS platform. This requires experience with VMS DCL and Fortran/C and automated pipelines. The data streams are:

- Polar: AT, OR, SPHA (KP done), PA, UVI, VIS, MFE (no KP), EFI (KP done), PIX, TID (no KP), HYD (no KP), CAM, TIM (no KP), CEP, PWI (no KP)
- Wind: AT, OR, SPHA, SWE, MFI (KP done), 3DP, EPA, WAV, WAVHR, SMS (no KP)
- Geotail (no NRT): AT, OR, SPHA, CPI, LEP, EPI, EFD, PWI, MGF
- NOAA solar indices

1. Convert and test the Key Parameter (KP) and similar generation software for the data streams above (except as noted as "no KP" or "KP done").
2. Convert, make operational and test the Near-Real Time (NRT) software system, including output of Level-zero and Key-parameter NRT streams to users. Setup process for restarting when hung and daily (between telemetry passes).
3. Adapt the NRT software to also process stored telemetry files from JPL and combine the best quality major frames from the NRT and stored data into daily Level-zero files.
4. During the parallel operations period (August to September 2002), monitor the production and compare to outputs from the CDHF and LZP systems of the following products:
   a. KP and similar product generation
   b. NRT output
   c. Daily Level-0 files from the revised NRT system

See <http://pwg.gsfc.nasa.gov/> for acronyms and other information.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

1. For item 1, test report and several comparison CDFs for each data stream, to be completed 1 month after task starts.
2. For item 2, test report and comparison data streams for each data stream (Polar and Wind data only), to be completed 2 months after task starts.
3. For item 3, test report and comparison of daily level-zero files for each instrument and housekeeping, orbit, attitude and spin-phase (Polar and Wind data only), to be completed 3 month after task starts.
4. For item 4, report at least weekly any discrepancies and problems.

9. PERFORMANCE/MILESTONE SCHEDULE: end 2002 Nov 30

10. QUALITY ASSURANCE REQUIREMENTS:

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED: none

12. OTHER (FUNDING, NTE, HOURS, ETC.): NTE 500 hours

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:	18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.
Robert M Candey Code 632 301-286-6707	6/5/02
14. BRANCH APPROVAL: Robert E. Lin 6/3/02	15. DIVISION CONCURRENCE: Nancy Lauenthal 6/3/02
16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:	CONTRACTING OFFICER'S SIGNATURE/DATE
17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE: Roger Dilling 6/3/02	James S. King Contracting Officer TYPED OR PRINTED NAME

GODDARD SPACE FLIGHT CENTER

TASK ASSIGNMENT

PART I - CONTRACTOR	PART II - CONTRACT NO. NAS-5-	
Raytheon STX Corporation	98156	
	TASK ASSIGNMENT NO. 308a (318)	JOB ORDER NO. 633-212-62-10-78

ORIGINATOR	ORGANIZATION CODE & PHONE	BRANCH APPROVAL	DIVISION CONCURRENCE
William Lawson	631 x6-3431	R. L. Pisarski	Nancy Lauderbach for J. L. Green 5/18/99

PART III (WHEN ADDITIONAL SPACE IS REQUIRED, USE REVERSE SIDE OF FORM)

a. DESCRIPTION OF WORK TO BE PERFORMED:

See attached for detailed description of Data Systems Development Task.

b. SCHEDULE OF PERFORMANCE

May 21, 1999 - November 30, 1999

PART IV - THE UNITED STATES OF AMERICA

THIS TASK ASSIGNMENT IS ISSUED PURSUANT TO THE PROVISIONS OF ARTICLE I OF THE SUBJECT CONTRACT.

Mary V. Stevens
Contracting Officer

August 12, 1999

Mary V. Stevens

SIGNATURE OF CONTRACTING OFFICER — DATE — TYPED NAME OF CONTRACTING OFFICER

Contractor's Copy No. 1

GSFC 18-45 (7/71)

Data Systems Development Task

The NSSDC manages a great deal of data, offline in deep archives and as inventories of CD-ROMS, nearline as data files on NDADS, and online both as FTP-accessible files and as files subsettable by time and parameter in systems such as CDAWeb and OMNIWeb. To offer the best services and products to customers, the NSSDC continuously evaluates evolving technologies and methodologies for potential inclusion into the NSSDC operational environment. The purpose of this task is to evaluate evolving technologies and methodologies relevant to NSSDC operations, make recommendations regarding future PBC implementations, and implement non-PBC functions as appropriate. Specifically, this task shall include the following:

- Prepare a plan for the evolution of NSSDC systems. The system evolution plan should take into account the latest developments in information system technology, including mass storage device technology, World Wide Web technology, and other key information system technologies. The plan should focus on strategies that allow the NSSDC to maintain leading-edge competencies and capabilities while satisfying customer requirements.

- Define and implement paradigms replacing the present project-datatype-eid paradigm and then ensure the links between the new user-accessible search terms to the bitfile IDs that are the main ID at the PBC bitfile management level.

TASK ORDER PAGE OF

Goddard Space Flight Center (INSTRUCTIONS AND DISTRIBUTION ON REVERSE)

1. CONTRACTOR: Raytheon ITSS	2. CONTRACT NO.: NAS5-98156	3. TASK/REVISION NO.: 319
4. JOB ORDER NO./PROJECT: SSDOO Support contract	5. FLIGHT HARDWARE/SOFTWARE; CRITICAL GSE (IF YES, OBTAIN BLOCK 16 CONCURRENCE): YES X NO	6. DESIGNATED FLIGHT

7. DESCRIPTION OF WORK TO BE PERFORMED (OBJECTIVES OR RESULTS DESIRED):

Title: Mission and Data System Engineering and Formulation

The SSDOO supports Directorate mission formulation and proposal activities through cost modeling of spacecraft bus, instrument designs, and data systems. System engineering is a key skill required to produce the associated cost models. As part of the cost modeling process, elements of the mission designs must be defined in terms components (ie: mass, structural composition, design heritage, and complexity). The contractor shall provide system engineering support needed to gather engineering data needed to model these new mission costs.

8. TASK DOCUMENTATION REQUIREMENTS/DELIVERABLE ITEMS:

System engineering analysis requires meticulous documentation of system parameters used in the cost modeling. This must be done for each mission studied.

9. PERFORMANCE/MILESTONE SCHEDULE:

April 1, 2003 - November 30, 2003

10. QUALITY ASSURANCE REQUIREMENTS:

None expected

11. TRAVEL, MATERIALS, ETC., KNOWN TO BE REQUIRED:

None expected

12. OTHER (FUNDING, NTE, HOURS, ETC.):

This is not a full time activity but the will vary based on the number of missions in the study.

13. TASK ORIGINATOR/MONITOR/CODE/PHONE:
ATR: Bill Lawson

14. BRANCH APPROVAL:

15. DIVISION CONCURRENCE: James Green

16. CONTRACTING OFFICER'S QUALITY REPRESENTATIVE:

17. CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE:
Roger Billing 4/2/2003

18. THIS TASK ORDER IS ISSUED PURSUANT TO THE TERMS OF THE CONTRACT.
4.2.03
James S. King
CONTRACTING OFFICER'S SIGNATURE/DATE

James S. King
TYPED OR PRINTED NAME

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

March 27, 2001

Raytheon STX Corporation
Attn: Ms. Wanda Neal
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Order Cancellation

As indicated below, the following Task Orders are cancelled:

Task Number	Title	Effective Date of Cancellation
109	Kinematic Modeling	3/27/01
114	IUE High Dispersion	

Please acknowledge receipt of this cancellation by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

James S. King
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

Wanda Neal 3/29/01

Signature Date

WANDA M. NEAL

Name

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

January 30, 2002

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Extension of Task Assignments

Option 2 of the subject contract extended the performance period to November 30, 2002. Attached is a listing of the specific task assignments, issued under CLIN 2 of the contract, that are extended as a result of the option exercise. Please note that Task 315 is extended only to March 31, 2002, and Task 316 is extended to October 13, 2002.

If you have any questions, I can be reached at 301-286-6993.

Sincerely,

James S. King
Contracting Officer

Cc: 630/Green, Dilling, Patala

NAS5-98156 Task List January 10, 2002

T:001 MANAGEMENT ATR: GREEN
T:003 ASTROPHYSICS MISSION SUPPORT SERVICES ATR: GEHRELS
T:101 AMASE DEVELOPMENT AND ADVANCED TECHNOLOGY SUPPORT (AMASE) ATR: CHEUNG
T:102 ADC ATR: CHEUNG
T:104 INFRARED/SUBMILLIMETER/RADIO ASTROPHYSICS DATA MANAGEMENT ATR: LEISAWITZ
T:107 ROSAT DATA PROCESSING & DATA DISTRIBUTION SUPPORT ATR: PISARSKI
T:110 AUTONOMOUS TECHNOLOGY ATR: VANSTEENBERG
T:111 ISAIA ATR: CHEUNG
T:113 GLAST ATR: FINK
T:115 SWIFT ATR: PISARSKI
T:201 IMAGE ATR: BURLEY
T:202 MAGNETOSPHERIC MODELING AND ANALYSIS ATR: FUNG
T:203 SPACE SCIENCE VISUALIZATION FACILITY ATR: KESSEL
T:204 SPACE PHYSICS SOFTWARE DEVELOPMENT, SYSTEM MAINTENANCE & SPECIAL PROJECTS ATR: MCGUIRE
T:205 SPACE PHYSICS DATA ACQUISITION AND VALUE-ADDED SERVICES ATR: MCGUIRE
T:301 COMPUTER SYSTEMS MANAGEMENT TASK ATR: BARRETT
T:302 SYSTEMS NETWORKING AND SMALL SYSTEMS ATR: GOUCHER
T:303 NSSDC COMMON DATA FORMAT (CDF) ATR: HAN
T:304 PLES ATR: JAMES
T:305 NASA/SCIENCE OFFICE OF STANDARDS AND TECHNOLOGY (NOST) ATR: SAWYER
T:306 INFORMATION (METADATA) SYSTEMS DEVELOPMENT & UPGRADES ATR: THIEMAN
T:307 SUN-EARTH CONNECTION EDUCATION FORUM (SECEF) ATR: THIEMAN
T:312 IMAGE ANALYSIS SUPPORT ATR: GREEN
T:313 COMMUNITY COORDINATED MODELING CENTER ATR: HESSE
T:315 VULNERBILITY TESTING ATR: SCHNEIDER
T:316 SOLAR NEBULA SiO ATR: NUTH

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

March 26, 2002

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Extension of CLIN 2 Task Assignment 315 and termination of CLIN 1 Support of the NSSDC Newsletter (Under Work Element 430)

1) CLIN 2, Task 315, previously extended to March 31, 2002, is hereby further extended to November 30, 2002.
2) Under CLIN 1, Work Element 430, the effort in support of the NSSDC Newsletter Preparation is hereby terminated as a contract requirement.

If you have any questions, I can be reached at 301-286-6993.

Sincerely,

James S. King
Contracting Officer

Cc: 630/Dilling, King, Schneider

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 216

September 27, 2002

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Extension of CLIN 2 Task Assignment 316 and termination of CLIN 2 Task Assignments 102 and 104

1) CLIN 2, Task 316, previously expiring on October 13, 2002, is hereby extended to November 30, 2002.
2) CLIN 2, Task Assignments 102 and 104 are terminated as of September 30, 2002.

If you have any questions, I can be reached at 301-286-6993.

Sincerely,

James S. King
Contracting Officer

Cc: 630/Dilling, Cheung, Nuth, Leisawitz

file

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of: 210.8

October 16, 2002

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Task Order Cancellation

As indicated below, the following Task Order is cancelled:

Task Number	Title	Effective Date of Cancellation
315	Automated Vulnerability Scanning and Reporting System	10/16/02

Please acknowledge receipt of this cancellation by signing and returning the duplicate copy of this letter to Code 216.

If you have any questions regarding the above, you may contact me at 301-286-6993.

James S. King
Contracting Officer

Enclosure

RECEIPT ACKNOWLEDGED

_____

Signature Date

_____

Name

National Aeronautics and
Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

November 26, 2002

Reply to Attn of: 210.8

Raytheon STX Corporation
Attn: Ms. Julie Smith
4400 Forbes Boulevard
Lanham, MD 20706

Subject: Contract NAS5-98156, Extension of Task Assignments

The exercise of Option 3 of the subject contract extended the performance period to November 30, 2003. Under CLIN 2 of the contract, all of the currently active tasks are hereby extended through November 30, 2003, except that Task 316 will expire on November 30, 2002.

If you have any questions, I can be reached at 301-286-6993.

James S. King
Contracting Officer

Cc: 630/Green, Dilling, Gaunt