FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0524 Navy METOC Support (Space)	16,644	17,732	21,627						CONT.	CONT.
X1452 GEOSAT	1,558	1,817	1,865						CONT.	CONT.
TOTAL	18,202	19,549	23,492						CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element supports Navy interests in meteorological and oceanographic (METOC) remote sensors. These interests include commitments to satellite, sensor, and operational demonstration/development activities associated with three satellite programs: 1) the Joint Service Defense Meteorological Satellite Program (DMSP), 2) The National Polar-orbiting Operational Environmental Satellite System (NPOESS) and 3) the Navy Geodetic/geophysical Satellite (GEOSAT) program, funded entirely by Navy. The passive microwave instruments carried on DMSP and future NPOESS provide global oceanic and atmospheric data of direct operational relevance, including sea surface wind, sea ice, and precipitation; GEOSAT altimeter data are used to observe significant wave height, ocean fronts and eddies, and internal acoustic structure. The Navy (METOC) Support (Space) project provides for Navy participation in Navy/Air Force cooperative efforts leading to DMSP sensor development, including calibration and validation of instruments and delivery of satellite products to the Fleet. WindSat, an initiative begun in 1997, is a partnered program that meets multiple Naval remote sensing requirements and provides a significant risk reduction for NPOESS, the converged Department of Commerce/National Oceanic and Atmospheric Administration/Department of Defense environmental satellite program. The Navy METOC Support (Space) project supports the Navy contribution to WindSat, which is fully funded via a formalized inter-agency agreement. The NPOESS Integrated

FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

Program Office is providing a portion of the funds for the WindSat sensor and the DOD Space Test Program (STP) is funding the satellite bus and providing the launch vehicle. The GEOSAT provided ocean topography information from 1985-1990. In 1991, the Navy began the development of a follow-on capability to continue providing this required ocean topography information via the GEOSAT Follow-On satellite, launched on 10 February 1998. Both the GEOSAT and Navy METOC (Space) projects fulfill Navy's obligation to develop Navy-unique, mission critical Space-based METOC technology.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

B. (U) PROGRAM CHANGE SUMMARY FOR TOTAL PE:

	FY 2000	FY 2001	FY 2002
(U) FY 2001 President's Budget:	14,497	19,730	21,618
(U) Adjustment from FY 2001 PRESBUDG:			
(U) Congressional Recissions	-57	-18	
(U) Execution Adjustment	+3,807		
(U) NWCF Rate Adjustment			+353
(U) NMCI Adjustment			+7
(U) Non Pay Inflation Adj			+13
(U) Program Adjustment			+1,501
(U) SBIR/STTR:	-45	-	-
(U) FY 2002 PRESIDENT'S Submission	18,202	19,549	23,492

FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0524 Navy (METOC) Support (Space)	16,644	17,732	21,627						CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Navy Meteorological and Oceanographic Sensor-Space (METOC)-Navy (METOC) Support (Space) project provides for Navy participation in Defense Meteorological Satellite (DMSP) Special Sensor Microwave/Imager (SSM/I) and Special Sensor Microwave Imager/Sounder (SSM/IS) calibration efforts, and future Navy-unique sensor development efforts (WindSat) in support of the Fleet operational requirements. The project ensures Navy operational requirements are satisfied primarily through demonstration of technologies for inclusion on operational constellations such as Defense Meterological Satellite Program (DMSP) and the National Polar-orbiting Operational Environmental Satellite System (NPOESS). These efforts fulfill Navy unique requirements that are not funded within the DMSP and NPOESS programs, and are in accordance with current inter-agency agreements. The project acquires information necessary to keep Navy ground receiving equipment compatible with future satellite data formats and data transfer rates. The project also provides for studies leading to operational improvements of satellite derived products and Navy participation as a voting member of the DMSP Configuration Control Board (CCB). Future funding plans respond to emerging Chief of Naval Operations requirements for Navy METOC data. Plans for FY 2000 and beyond address the requirement for high-resolution METOC imagery to ships, in particular the Indian Ocean and Arabian Gulf region. The Indian Ocean METOC Imager (IOMI) mission will be executed cooperatively with the development of the NASA EO-3 New Millenium Program Geostationary Imaging Fourier Transform Spectrometer (GIFTS). The NASA GIFTS instrument enhanced for extended operational utility will meet Navy imaging requirements while satisfying NASA's technology demonstration objectives. This enhanced operational utility will promote a rapid technology infusion into next generation NOAA Geo-stationary Operational Environmental

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

Satellites (GOES). An inter-agency partnership will be formed with NASA for the development of GIFTS and with NASA and NOAA for data calibration and validation.

FY 2002 RDT&E,N PE/PROJECT COST BREAKDOWN DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC) PROJECT TITLE: Navy METOC Support (Space)

. (U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 2000 ACCOMPLISHMENTS:
   - (U) (1,190k) Continued participation in DMSP Special Sensor Microwave/Imager (SSM/I) calibration and validation. Continued data quality assurance activities in support of operational products. Continued fabrication and began integration of the Airborne Polarimetric Microwave Imaging Radiometer (APMIR) to use for calibration/validation of DMSP SSM/I, and SSM/IS, and WindSat development, calibration, and validation.
   - (U) (15,354k) Completed final design for WindSat and prototype component testing. Completed manufacturing readiness review and began flight hardware procurement. Continued development of algorithms and ground software for the delivery of environmental data records for use with WindSat data.
   - (U) (100k) Began support of IOMI sensor development and spacecraft development trade studies.

2. (U) FY 2001 PLAN:
   - (U) (1,128k) Conduct SSM/I calibration and validation and begin the calibration and validation effort associated with the new expected launch of the first DMSP SSM/IS. Complete the integration, and flight testing of Airborne Polarimetric Microwave Imaging Radiometer (APMIR) to use for calibration/validation of DMSP SSM/I and SSM/IS sensors, and WindSat development. Prepare for WindSat calibration and validation.
   - (U) (16,287k) Complete WindSat sensor development and deliver to spacecraft vendor. Integrate the sensor with the Coriolis spacecraft, begin system tests and prepare for launch operations. Continue development of algorithms and ground software for WindSat environmental data records.
   - (U) (190k) Continue support of IOMI sensor development. Continue spacecraft development efforts.
   - (U) (127k) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2002 PLAN:

- (U) (1,400k) Continue to monitor SSM/I performance and continue validation effort associated with the DMSP SSM/IS. Conduct field experiments with APMIR to use for calibration/validation of DMSP SSM/I, SSM/IS sensors, and the WindSat sensor.

- (U) (9,751k) Complete flight payload and spacecraft testing and conduct full space vehicle system testing including environmental testing. Complete development and testing of algorithms and ground software for WindSat environmental data records. Complete WindSat launch processing, launch operations, early orbit checkout and on-orbit calibration and validation.
- (U) (10,476k) Begin spacecraft development in support of IOMI. Continue support of sensor development.

B. (U) PROGRAM CHANGE SUMMARY: See total program change summary for P. E.

C. (U) OTHER PROGRAM FUNDING SUMMARY: DOC/NOAA Appropriation Procurement, Acquisition, and Construction, Polar Convergence.

(U)RELATED RDT&E:
(U) PE 0603434F Air Force, NPOESS
(U) PE 0605864F, Air Force, DOD STP
(U) PE 0305160F, Air Force DMSP
(U) PE 0604218N, Air/Ocean Equipment Engineering
(U) SAT 809/00110 NASA 258-30, Science, Aeronautics, & Technology; Office of Earth Science Research and Technology

FY 2002 RDT&E,N PE/PROJECT COST BREAKDOWN DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC) PROJECT TITLE: Navy METOC Support (Space)

D. (U) SCHEDULE PROFILE: Not applicable.

FY 2002 RDT&E,N PE/PROJECT COST BREAKDOWN DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC) PROJECT TITLE: Navy METOC Support (Space)

A. (U) PROJECT COST BREAKDOWN: ($ in thousands)

Project Cost Categories	FY 2000	FY 2001	FY 2002
a. Satellite Development	2,300	7,370	12,028
b. Payload Development	13,154	9,234	8,199
c. Science and Calibration/Validation	765	854	1,000
d. Airborne Testbed	425	274	400
e. Support GFO	0	0	0
Total	16,644	17,732	21,627

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION ($ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method Fund Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 2000 Budget	FY 2001 Budget	FY 2002 Budget	To Complete	Total Program
Product Development									
Misc.	Misc.	N/A	CONT.	CONT.	15,006	16,604	20,227	CONT.	CONT.
Support and Management:									

FY 2002 RDT&E,N PE/PROJECT COST BREAKDOWN DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC) PROJECT TITLE: Navy METOC Support (Space)

Misc.	Misc.	N/A	CONT.	CONT.	0	0	0	CONT.	CONT.
Test and Evaluation:									
Misc.	Misc.	N/A	CONT.	CONT.	1,638	1,128	1,400	CONT.	CONT.
TOTAL:					16,644	17,732	21,627	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY: Not Applicable

	FY 2000 Budget	FY 2001 Budget	FY 2002 Budget	To Complete	Total Program
Subtotal Product Development	15,006	16,604	20,227	CONT.	CONT.
Subtotal Support and Management:	0	0	0	0	0
Subtotal Test and Evaluation:	1,638	1,128	1,400	0	0
Total Project	16,644	17,732	21,627	CONT.	CONT.

FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

(U) COST (Dollars in thousands)

PROJECT NUMBER & Title	FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	To Complete	Total Program
X1452 GEOSAT	1,558	1,817	1,865						CONT.	CONT.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides a satellite-borne radar altimeter sensor to obtain ocean topography measurements from which tactically significant features such as ocean fronts, and eddies, wave heights, internal acoustic structure, and sea-ice edges are derived. Topography provides a unique and important data source in support of a number of Naval warfare areas such as anti-submarine and undersea warfare. It also provides other agencies, such as National Oceanic and Atmospheric Administration and National Aeronautics and Space Administration with valuable inputs to studies involving Pacific Ocean temperature oscillations, global warming and climate change. Ocean topography data was previously provided by GEOSAT from 1985 until the satellite failed in January 1990. The GEOSAT Follow-On (GFO) satellite provides altimetry data until altimetry data becomes available from a future national environmental satellite system.

FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC) PROJECT NUMBER: X1452
PROJECT TITLE: GEOSAT

- (U) PROGRAM ACCOMPLISMENTS AND PLANS:

1. (U) FY 2000 ACCOMPLISHMENTS:

- (U) (135k) Funded on-orbit performance incentive.
- (U) (343k) Developed improved ground station satellite data processing techniques.
- (U) (1080k) Assessed on-orbit system performance, conducted payload calibration/validation and resolved performance anomalies.

2. (U) FY 2001 PLAN:

- (U) (753k) Fund on-orbit performance incentive.
- (U) (352k) Develop improved ground station satellite data processing techniques.
- (U) (665k) Continue to assess on-orbit system performance, conduct payload calibration/validation and resolve performance anomalies.
- (47K)Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2002 Plan:

- (U) (800k) Fund on-orbit performance incentive.
- (U) (373k) Develop improved ground station satellite data processing techniques.
- (U) (692k) Continue to assess on-orbit system performance, conduct payload calibration/validation and resolve performance anomalies.

FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)
PROJECT NUMBER: X1452
PROJECT TITLE: GEOSAT

B (U) PROGRAM CHANGE SUMMARY: See Program change summary for total P.E.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:
(U) PE 0604218N (Air/Ocean Equipment Engineering)

D. (U) SCHEDULE PROFILE:

	FY 2000	FY 2001	FY 2002
Program Milestones			
Engineering Milestones			
T&E Milestones	On orbit tests	Oper Supt	Oper Supt
Contract Milestones	Not Applicable		

FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC) PROJECT NUMBER: X1452
PROJECT TITLE: GEOSAT

A. (U) PROJECT COST BREAKDOWN: ($ in thousands)

Project Cost Categories	FY 2000	FY 2001	FY 2002
a. Satellite Development	1,558	1,817	1,865
b. Sensor Development	0	0	0
c. Contractor Engineering Support	0	0	0
Total	1,558	1,817	1,865

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION ($ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method Fund Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 2000 Actual	FY 2001 Budget	FY 2002 Budget	To Complete	Total Program
Product Development									
Ball Aerospace w/Options	CPIF	8/92	85,213	85,213	788	965	1,119	CONT.	CONT.
Various	Various	N/A	CONT.	CONT.	770	852	746	CONT.	CONT.

Support and Management: Not Applicable

FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)
PROJECT NUMBER: X1452
PROJECT TITLE: GEOSAT

Contractor/ Government Performing Activity	Contract Method Fund Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 2000 Actual	FY 2001 Budget	FY 2002 Budget	To Complete	Total Program
Various					0	0	0	CONT.	CONT.
Test and Evaluation: Not Applicable									
TOTAL:					1,558	1,817	1,865	CONT.	CONT.

GOVERNMENT FURNISHED PROPERTY Not Applicable

	FY 2000 Actual	FY 2001 Budget	FY 2002 Budget	To Complete	Total Program
Subtotal Product Development	1,558	1,817	1,865	CONT.	CONT.
Subtotal Support and Management		0	0	CONT.	CONT.
Subtotal Test and Evaluation Not Applicable					
Total Project	1,558	1,817	1,865	CONT.	CONT.

FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)
PROJECT NUMBER: X1452
PROJECT TITLE: GEOSAT