BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N
PROGRAM ELEMENT TITLE: Integrated Surveillance System

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE
X0766 IUSS Detect/ Classif System	11,245	24,872	14,235
X0758 SURTASS	5,663	12,212	5,806
TOTAL	16,908	37,084	20,041

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Program Element (P.E.) comprises two projects - X0766 and X0758. Project X0766 provides for Integrated Undersea Surveillance Systems (IUSS) Research and Development Projects. Project X0758 is for the Surveillance Towed Array Sensor (SURTASS) development efforts. IUSS provides the Navy with its primary means of submarine detection both nuclear and diesel. The program has undergone a major transition from emphasis on maintaining a large dispersed surveillance force keyed to detection and tracking of submarines to a much smaller force that is effective against modern diesel and nuclear submarines in regional/littoral or broad ocean areas of interest. This transition preserves the ability to continue open ocean surveillance.

(U) The IUSS Research and Development project (X0766) funds Fixed Surveillance Systems (FSS), which encompasses the Sound Surveillance System (SOSUS), the Surveillance Direction System (SDS), and the Fixed Distributed System (FDS), as well as SURTASS Low Frequency Active (LFA) developments. The number of SOSUS processing sites has been reduced and the display and processing equipment used at the remaining sites has been converted to SDS/SSIPS (Shore Signal and Information Processing Segment) to significantly lower life cycle costs and enable system-wide consolidation. SURTASS LFA will provide an active adjunct capability for IUSS passive and tactical sensors to assist in countering the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow quiet threats in harsh littoral waters.

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0204311N
PROGRAM ELEMENT TITLE: Integrated Surveillance System

(U) In order to continue with reductions in life cycle costs and continue with system-wide consolidation, a long-term goal is to develop a single IUSS processor based on NAVSEA's Acoustic Rapid COTS Insertion (ARCI) program. The IUSS processor will have the capability to process and display data from future underwater systems (such as the Advanced Deployable System (ADS) and FDS-C). The IUSS processor will also have the capability to replace the legacy systems (SSIPS, SDS, and SURTASS) as they reach end of life and require upgrading.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: Budget Activity 7: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N PROJECT NUMBER: X0766
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: IUSS

(U) COST (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE
X0766 IUSS Detect/Classif System			
TOTAL	11,245	24,872	14,235

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: LFA will provide an active adjunct capability for IUSS passive and tactical sensors to counter the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow quiet threats in harsh littoral waters. Improvements include Twin-Line/LFA integration enhancements; advanced waveforms for littoral/shallow water operations including doppler sensitive waveforms; and processing algorithms to reduce clutter and reverberation false alarms in shallow water. Also includes Adaptive Beamforming; Integration of tactical decision aids for LFA monostatic and bistatic operation; integration of SURTASS active and passive information processing systems to provide contact association and geographic tracking; and common antisubmarine warfare (ASW) OMI and environmental processing. The LFA task includes development and testing of a compact LFA transmit source array for SWATH-P ships.

B. (U) PD18 is involved with the development and maintenance of various IUSS systems. These systems include FDS, FDS-C, SDS, SURTASS, and ADS. The near term objective is to obtain a common Operator Machine Interface (OMI) among currently fielded systems. The long-term goal is to develop a single IUSS processor baseline, with minor maintenance efforts continuing on fielded systems. The existing system architecture, signal processing, contract management, and reporting requirements will be evaluated as well as the requirements for future systems. The development of the IUSS processor will take advantage of automation advancement, array technology improvements, and submarine and surface system commonality.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 2000 Accomplishments:

- (U) ($ 3,925) Continue design and development of software to transition IUSS to a common processing architecture.
- (U) ($ 1,500) Continue scientific research program to support operational deployment of LFA.
- (U) ($ 1,560) Conduct DT/OT testing of T-AGOS 23 SURTASS/LFA system.

- (U) ($ 2,562) Continue LFA development and integration in support of DT/OT testing of T-AGOS 23 SURTASS/LFA system. Correct software issues identified during conduct of DT/OT testing.

- (U) ($ 1,441) Complete transition of SURTASS and SSIPS/SDS to a common OMI. Complete Factory Acceptance Testing (FAT) at each developer facility and install into fielded legacy systems. Prototype requested fleet enhancements to common OMI baseline.

- (U) ($ 257) Continue integration of IUSS into the Fleet C4ISR architecture.

1. (U) FY 2001 Plans:

- (9,433) Develop fiber optic sensor technology for a long life all optical underwater surveillance system.

- (4,965) Develop/expand the collaborative planning functionality of WeCAN to include other multi-mission warfare areas.

- (3,296) Continue design and development of software to transition IUSS to a common processing architecture(ARCI). Verify design and functionality via in lab demonstration testing and sea tests.

- (3,388) Continue sea testing and LFA development to improve performance in shallow water/littoral regions to support ARG operations. Conduct LFA Cory shakedown tests to verify system operability and operator training.

- (1,200) Continue scientific research program to support operational deployment of LFA.

- (890) Continue integration of IUSS into the Fleet C4ISR architecture.

- (1,000) Conduct trade-off analysis for LLFA array, processing, array handling and ship modification.

- (700) Conduct trade-off and mission studies to explore networked ASW system concepts, investment alternatives and development of a community-wide strategy for common performance models.

2. (U) FY 2002 PLANS

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N PROJECT NUMBER: X0766
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: IUSS

- (1,903) FSS – Continue design and development of software and perform hardware evaluations to transition IUSS to a common processing architecture. Verify design and functionality via in lab demonstration testing.
- (866) LFA MSIII – Conduct T-23 development testing/Operational Testing (DT/OT) certification testing. Correct software issues uncovered during testing.
- (3,099) Common Acoustic Processor – Complete development of SURTASS ARCI(I) capability for all single line array types. Develop software for Twin-Line processing in the ARCI(I) architecture.
- (1,800) Surveillance System Integration – Continue integration of SURTASS ARCI(I) capability with IUSS legacy systems. Integrate future ARCI(I), Comms, and TDA improvements.
- (3,679) Active Acoustics – Continue implementation of a multi-year sea test program focused on CONOPS and the physics of shallow water. Develop improvements for LFA operations in shallow water, conduct analysis, simulations, and trade-off studies to define the optimum configuration of shallow water sources, including frequency diversity and power levels, source technology, array handling configurations/platforms. Continue sea test program to support system improvements and demonstrate/validate operational concepts.
- (1,200) LFA Environmentals – Continue environmental research on the effect of low frequency active sonar on marine mammals.
- (1,100) N84 ASW Study – Continue conducting trade-off and mission studies to explore networked ASW system concepts, investment alternatives and development of a community-wide strategy for common performance models.
- (588) ASWC4I – Continue performing engineering, analysis and trade-offs; conduct proof of concept testing to support IUSS integration into the Navy’s C4I architecture, including IT-21 implementation. Continue supporting IUSS C4I IPT. Coordinate the development of GCCS-M ASW Tactical Decision Aids (TDAs). Define ASWC4I system concepts, system interfaces and architecture.

B. (U) PROGRAM CHANGE SUMMARY:

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N PROJECT NUMBER: X0766
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: IUSS

FY 2000: SBIR Assessment (-$262K), Miscellaneous Navy Adjustments (-$376K), Section 8055 Congressional Proportionate Rescission (-$47K).
FY 2001: Section 8086 .7% Pro-Rata Reduction (-$176K), Congressional Plus-Up WECAN Tech to Other Warfare Areas and Domain (+$5,000K), Congressional Plus-Up Advanced Deployable System (+$9,500K), Government Wide Recission (-$55K).

(U) Schedule/Technical: FY00, delay start of Compact Low Frequency Active (CLFA) development to FY04. FY00, delay in DT/OT of T-23 to FY02.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE	ESTIMATE
OPN# 2225	0	0	0	2,000
OMN 1C3C	26,624	29,635	29,936	31,149
OPN# 2237	7,081	5,465	17,650	20,825

(U) RELATED RDT&E:
(U) PE 0204311N(Integrated Surveillance System)
(U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)
(U) PE 0603747N(Undersea Warfare Advanced Technology)

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N PROJECT NUMBER: X0766
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: IUSS

D. (U) ACQUISITION STRATEGY:

	FY 2000	FY2001	FY2002
Program Milestones			
Engineering Milestones		ARCI A-180R VARIANT 7/01	
T&E Milestones		SEA TEST ARCI A180R VARIANT	SEA TESTS DT-8/02
Contract Milestones		T-AGOS 23 DLVRY 3/01	ARCI (I) PROCUREMENT

Exhibit R-3, FY 2002 RDT&E,N Project Cost Analysis DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311 PROJECT NUMBER X0766
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: IUSS

Exhibit R-3 Cost Analysis (page 1)													Date: Sep 2000
RDT&E/Budget Activity 7			PROGRAM ELEMENT: 0204311N										SURTASS x0766
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY01 Cost	FY01 Award Date	FY02 Cost	FY02 Award Date						
WeCAN	CPFF/ WX	ORINCON/Var	0	4,965	Apr-01								
FDS/AODS	CPFF/ WX	TBD	0	8,000	Sep-01								
IUSS Common Architecture/Surveillance System Integration	CPFF	DSR/LM/ARL/Var	24,148	4,491	Nov-00	6,377	Oct-01						
Environmental Research	WR	ONR	5,500	1,200	Nov-00	1,200	Nov-01						
LFA Improvements/LFA MS III Active Acoustics	CPFF/ WX	RSC/LS/DSR/Var	80,555	1,643	Nov-00	2,404	Nov-01						
C4I Integration	CPFF/WX	Various	31,278	165	Nov-00	413	Nov-01						
N84 ASW Study	WX/PD	NUWC/APL	0	700	Nov-00	1,100	Nov-01						
Various	WX	Various	28,457	0		0							
Subtotal Product Development			169,938	21,164		11,494							

Remarks:
ORINCON= San Diego, CA
Litton= Woodland Hills, CA
RSC= Raytheon Systems Co. Portsmouth, RI
LM= Lockheed Martin, Manassas, VA
TRW=TRW Systems Div., San Diego, CA
L/S= Lockheed Sanders, Nashua, NH
DSR = Digital System Resources, Fairfax, VA

Exhibit R-3 Cost Analysis (page 2)									Date: Sep 2000			
RDT&E/Budget Activity 7			PROGRAM ELEMENT: 0204311N						SURTASS x0766			
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY01 Cost	FY01 Award Date	FY02 Cost	FY02 Award Date					
IUSS Common Arch./ Surveillance System Integration	WX	Various	990	0	N/A	0	N/A					
LFA Improvements/ LFA MSIII Active Acoustics	CPFF	TRW/Various	2,930	625	Nov-00	450	Nov-01					
C4ISR Integration	CPFF	TRW/Various	1,534	175	Nov-00	175	Nov-01					
FDS/AODS	WX	Various	0	1433	May-01	0	N/A					
Subtotal Support			5,454	2,233		625						
RDT&E/Budget Activity 7									SURTASS x0766			
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY01 Cost	FY01 Award Date	FY02 Cost	FY02 Award Date					
IUSS Common Arch./ Surveillance System Integration	Var/WX	Various	651	0	N/A	400	Nov-01					
LFA Improvements/ LFA MSIII Active Acoustics	Var/WX	Various	2,975	1,325	Var.	1,566	Var.					
Subtotal T&E			3,626	1,325		1,966						

Remarks

EXHIBIT R-3, FY 2002 RDT&E PROJECT COST ANALYSIS DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N PROJECT NUMBER: X0766
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: IUSS

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY01 Cost	FY01 Award Date	FY02 Cost	FY02 Award Date					
LFA Improvements/C4ISR	Var/Wx	Various	1,437	150	Var.	150	Var.					
Subtotal Management			1,437	150		150						
Total Cost			180,455	24,872		14,235						

Exhibit R-2a, FY 2002 RDT&E,N Budget Item Justification (Project) DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311 PROJECT NUMBER X0758
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: SURTASS

PROJECT NUMBER & TITLE	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE
X0758 SURTASS	5,663	12,212	5,806

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The SURTASS project comprises the mobile, tactical arm of the Integrated Undersea Surveillance System, providing long range detection and cueing for tactical weapons platforms against both diesel and nuclear powered submarines. With the SOSUS Arrays being placed in a standby status (data available but not continuously monitored), SURTASS must provide the undersea surveillance necessary to support regional conflicts and sea-lane protection. SURTASS has experienced recent passive and active success against diesel submarines operating in shallow water. SURTASS is greatly reducing costs by consolidating logistics support, using Non-Developmental Items and commercial hardware, and increasing operator efficiency through computer aided detection and classification processing. SURTASS development efforts include: twin-line array processing, improved detection and classification/passive automation to counter quieter threats; additional signal processing and bi-static active capability; integrated active and passive operations; improved Battle Group support; and improved information processing. Functional improvements are delivered to the Fleet in software "Builds". Build #1 (FY 95) included source-set formulation and analysis tools, automated line trackers and nuclear source auto-detector. Build #2 (FY 96) included wideband energy trackers, wideband/narrowband feature association, and diesel Full Spectrum Processing (FSP). Build #3 (FY 97) included automated localization and tracking, diesel automated detectors. Build #4 (FY 98) included twin-line integration, automated classification aids that provide surface/subsurface target discrimination and subsurface target classification clues. Build #5(FY 99) includes bi-static LFA signal processing and integration of active and passive information processing subsystems to improve contact association and geographic tracking performance. Build #6 (FY00) focuses on improvements to the Twin-Line processing capability and increases bandwidth to shore. It also includes the initial investment in the common acoustic processor for IUSS based on the ARCI program.

Exhibit R-2a, FY 2002 RDT&E,N Budget Item Justification (Project) DATE: June 2001

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311 PROJECT NUMBER X0758
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: SURTASS

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 2000 Accomplishments:

- (1,071) Develop processing improvements to support transition to TB-29 common towed array and expand array interoperability.
- (1,581) Complete software development to support increased data processing on shore to support tactical operations.
- (967) Continue computer aided detection, classification and tracking to improve passive performance to support tactical operations in high clutter environments.
- (844) Continue software development to improve Bi-static operations in littoral/shallow water regions.
- (1,200) Develop software to transition to Common Processor.

2. (U) FY 2001 PLANS:

- (2,000) TB-29/Twin-Line – Continue hardware and software development and processing improvements to support TB-29 operations and expand array interoperability.
- (1,845) Passive Processing & Automation – Continue Computer Aided Detection, Classification, and Tracking improvements, and development of automated tools to improve passive performance to support tactical operations and reduce operator workload in high clutter environments.
- (2,367) Bi-Static and Shore Processing – Continue software development to improve Bi-Static Processing in littoral/shallow water regions. Develop Link Management capabilities for providing Bi-Static data to shore to reduce requirements for deploying Military Detachments (MILDETS).
- (6,000) Onboard Signal Processor – Integrate SURTASS shipboard processing (ARCI) into a network-Centric architecture to extend SURTASS capabilities to other tactical platforms.

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N PROJECT NUMBER: X0758
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: IUSS

3. (U) FY 2002 PLANS:

- (1,923) Passive Processing & Automation – Develop capability for monitoring low priority beams, improved acoustic signature formation, and target passive ranging. Continue development of software for processing off-board (autonomous) sensor data.

- (2,000) TB-29/Twin-Line – Continue processing improvements to support TB-29 operations and expand array interoperability. Develop across platform telemetry architecture.

- (1,883) Shore Processing – Continue incorporation of OMI Commonality Working group guidance. Continue development of Link Management functionality. Develop shore processing capability for TB-29A array and off-board sensors.

B. (U) PROGRAM CHANGE SUMMARY

FY 2000: SBIR Assessment (-$157K), Miscellaneous Navy Adjustments (-$200K), Section 8055: Congressional Proportionate Rescission (-$23K).
FY 2001: Section 8086 .7% Pro-Rata Reduction (-$86K), Congressional Plus-Up ASW Combat Sys Int - Onboard Signal Processor (+$6,000K), Government-Wide Rescission (-$27K).

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE
OMN 1C3C	26,624	29,635	29,936
OPN 2237	7,081	5,465	17,650

(U) RELATED RDT&E:

(U) PE 0204311N(Integrated Surveillance System)
(U) PE 0603785N(Combat Systems Oceanographic Performance Assessment)
(U) PE 0603747N(Undersea Warfare Advanced Technology)

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N PROJECT NUMBER: X0758
PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: IUSS

D. (U) ACQUISITION STRATEGY:

	FY 2000	FY2001	FY2002
Program			
Engineering Milestones		ARCI A-180R VARIANT 7/01	
T&E Milestones		SEA TEST ARCI A180R VARIANT	
Contract Milestones			TB-29A Procurement

Exhibit R-3 Cost Analysis (page 1)													Date: Sep 2000
RDT&E/Budget Activity 7		PROGRAM ELEMENT: 0204311N											SURTASS x0758
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY01 Cost	FY01 Award Date	FY02 Cost	FY02 Award Date						
Passive Auto	CPFF	APL/DSR	22,952	1,845	Nov-00	1,923	Nov-01						
Array Improvements	CPFF/WR	APL/SSC/Var	16,451	1,075	Nov-00	1,075	Nov-01						
Processing Improvements/Shore Processing	CPFF	ARL/DSR/Var	24,588	1,957	Nov-00	1,473	Nov-01						
Various	Var/WX	Various	15,103	0	Nov-00	0	Nov-01						
Common Processor	WX	DSR	1,200	0	N/A	0	N/A						
Onboard Signal Processing	Var/WX	Various	0	5,675									
Subtotal Product Development			80,294	10,552		4,471							

Remarks:

APL = APL/JHU

RSC = Raytheon Systems Co.

SSC = SPAWAR Systems Center.

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0204311N PROJECT NUMBER: X0758

PROGRAM ELEMENT TITLE: Integrated Surveillance System PROJECT TITLE: SURTASS

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY01 Cost	FY01 Award Date	FY02 Cost	FY02 Award Date					
Passive/Array Improvements	Var/Wx	Various	1,838	375	Nov-00	375	Nov-01					
Onboard Signal Processing	Var/Wx	Various	0	125								
Subtotal Support			1,838	500		375						
Remarks												
Passive/Array improvements	Var/WX	MISC.	3.313	945	Nov-00	945	Nov-01					
Onboard Signal Processing	Var/WX	Various	0	100								
Subtotal T&E			3,313	1,045		945						
Remarks												
Passive/Array improvements	Var/WX	MISC.	522	15	Nov-00	15	Nov-01					
Onboard Signal Processing	Var/WX	Various	0	100								
Subtotal Management			522	115		15						
Remarks												
Total Cost			85,967	12,212		5,806						

(Exhibit R-3, page 2 of 2)