FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0708011N
PROGRAM ELEMENT TITLE: Manufacturing Technology Development

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R1050 Manufacturing Technology	51,892	58,909	59,104	60,179	61,406	62,190	62,931	65,472	CONT.	CONT.
R2674 Manufacturing Technology	0	9,977	0	0	0	0	0	0	0	9,977
Total	51,892	68,886	59,104	60,179	61,406	62,190	62,931	65,472	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Manufacturing Technology (MANTECH) Program is intended to improve the productivity and responsiveness of the U.S. defense industrial base by funding the development of manufacturing technologies. The MANTECH program, by providing seed funding for the development of moderate to high risk process and equipment technology, permits contractors to upgrade their manufacturing capabilities. Ultimately, the program aims to produce high-quality weapon systems with shorter lead times and reduced acquisition costs. Major areas of endeavor both underway and planned include: advanced manufacturing technology for electronics assembly, laser metalworking, flexible computer manufacturing, composites, metal working and welding technology. The MANTECH program is being integrated into the Joint Mission Area/Support Area and Joint Warfare Operational Capability process and will utilize the results of these initiatives as appropriate in the program planning process. The MANTECH program is aimed at achieving affordability in the acquisition of weapons systems by inserting manufacturing process solutions early into the design phase to reduce lifecycle costs, improve schedules and ensure quality.

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PROGRAM ELEMENT: 0708011N
PROGRAM ELEMENT TITLE: Manufacturing Technology Development

(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.

(U) PROGRAM CHANGE FOR TOTAL P.E.:

	FY 1998	FY 1999	FY 2000
(U) FY 1999 President's Budget:	53,369	59,060	59,867
(U) Appropriated Value:	-	69,060	-
(U) Adjustments from FY 1999 PRESBUDG:	-1,477	+9,826	-763
(U) FY 2000 President's Budget Submission:	51,892*	68,886	59,104

* $22,676 thousand of FY 1997 carryover funding being utilized in addition to the control amount of $51,892 thousand.

(U) Funding: FY 1998 adjustment is due to Small Business Innovation Research assessment (-1,473) and update to reflect actual execution (-4). FY 1999 adjustment is due to congressional undistributed reductions (-174) and a congressional plus-up to fund MANTECH shortfall (+10,000). FY 2000 adjustment is due to Navy Working Capital Fund rate adjustment (+46), Civilian Pay Rates (+46), and non pay inflation (-855).

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 PLAN: (While the control amount for FY 1998 is $51,892, the actual execution amount is $74,568 thousand. This reflects $22,676 thousand of FY 1997 carryover to FY 1998.)

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050
PROGRAM ELEMENT TITLE: Manufacturing Technology Development PROJECT TITLE: Manufacturing Technology

- (U) The Navy MANTECH program executes a significant amount of its projects through the Centers of Excellence. The technical efforts performed are reflected throughout the following taxonomy:

  -- (U) ($15,087) Composites and Processing Fabrication - Continued the Composites Affordability Initiative, and initiated a Composites Topside Structure project. Continued work on the Fiber Inlet Duct, Gearbox Housing, Composites Shipboard Electronic Cabinets, Rapid Response, Teaching Factories and Korex Phase II. Terminated Fiber Steering for Lightweight Affordable Composite Structures, Z-Direction Reinforcement for Composite Laminates, Insitu Fiber Placement, C-Section Composites, and Injection Molded Thermoplastic Bearing Cages.

  -- (U) ($9,000) Electronics Processing and Fabrication - Continued the AEGIS electronics demonstration, continued Flexible manufacturing of microwave vacuum electronic devices, continued Diamond Film Packaging for Transmit Receive Modules, continued Sapphire Dome Coatings, continued Diode Pump Erbium Glass Laser Range Finders, continued Low Cost Manufacture of Infrared Focal Plane Arrays, and continued Manufacture Automation of Monolithic Ring Gyros.

  -- (U) ($25,500) Metals Processing and Fabrication – Completed Programmable Automated Welding System; Weld Fumes; Gas Tungsten Arc Welding Flux for Increased Penetration; Netshape Finishing of Gears by Ausforming; and LaserARC Rapid Response. Cancelled Process Development of Advanced Gear Steels; Condition Based Maintenance; and Manufacturing Improvements for F/A-18 Cockpit Displays. Continued Spray Forming in support of Joint Strike Fighter; Centrifugal Cast Titanium Carbide Bronze Implements; Commercialization of Advanced Welding Consumables; Titanium Welding; Weld Residual Stress and Distortion; Modeling of Clamping Distortions and Prediction of Gear Accuracy; laser Processing of Nickel Aluminum Bronze; Non-Contact Highspeed Gear Inspection; Adhesive Bondline Integrity, and Underwater Wet Welding. Initiated Distortion and Accuracy Control in Welding. Restarted Laser Pipe Welding.

  -- (U) ($8,750) Advanced Manufacturing Enterprise - Continued efforts in identifying best commercial practices to be incorporated into the Acquisition Reform regime. Initiated efforts to establish a stronger linkage between the Best Manufacturing Practices program and the Acquisition Center of Excellence. Initiate efforts to support the Naval Sea Systems Command Maritime Technology Advanced Shipbuilding Enterprise program. Continued Shipbuilding Supplier Chain Integration in support of the Lean Shipbuilding initiative.

Recompeted the Gulf Coast Region Maritime Technology Center in order to continue shipbuilding efforts such as Non-Toxic Pigment Substitute for Chromium in Primer for Aluminum Substrates, continued Simulation Based Design initiatives, continued Environmental Resource Information Center, continued Research in Shipboard Sensors and continued Effective Aluminum Catamaran Structure Extrusions.

-- (U) ($16,231) Other - Continued projects in the repair technology arena that support the depots and shipyards such as Supercritical CO2 Parts Cleaning, Ball Valve Repair Process Improvement, Shearography System Development, and Reverse and Re-Engineering Technical Data Generation System. Continued the Ammonium Dinitramide; Low Cost Shaped Charge Munitions Manufacturing; and Improved Technology for Line Charge Manufacturing. Completed the Composite Propellants project in support of energetic materials. Completed technology transfer efforts at the Manufacturing Technology Transfer Center. Continued Phase III of the F414 Engine Demonstration Device with General Electric. Continued Production Tooling for Concept 1 Payload in support of Surface Ship Torpedo Defense. Initiated research efforts in support of the Advanced Shipbuilding Enterprise. Continued efforts in Propulsor Encapsulation. Funded technical engineering work at Navy labs and field activities to support Center projects.

2. (U) FY 1999 PLAN:

- (U) The Navy MANTECH program executes a significant amount of its projects through the Centers of Excellence. The technical efforts performed are reflected throughout the following taxonomy:

-- (U) ($14,000) Composites Processing and Fabrication - Continue work on the Composites Affordability Initiative, the Composites Topside Structures, KOREX II; Enhanced Production Techniques for Low Observable Structures and Materials; Gearbox Housing; Teaching Factory and Rapid Response projects, and Restart Z-Direction Reinforcement for Composite Laminates. Initiate new effort in Ceramic Matrix Composites and Resin Transfer Molding.

-- (U) ($10,000) Electronics Processing and Fabrication - Continue AEGIS Electronic Demonstration, Flexible Manufacturing of Microwave Power Module Manufacturing, Learning Center and Demonstration Factory, and the Power Electronic Building Blocks Manufacturing plan. Continue electro-optics efforts in Sapphire Domes,

Manufacturing Automation of Monolithic Ring Gyros; and initiate efforts for Fiber Optic Velocity Sensors, Remote Source Lighting Technology, Conformal Acoustic Velocity Sensor Accelerometer Manufacturing, Radio Frequency Photonics for Multi-Function Phased Array Antennas, and Affordable Array Technology Tooling.

-- (U) ($22,850) Metals Processing and Fabrication - Continue the following metalworking projects: Centrifugally Cast Titanium/Chromium Bronze Components, Neodymium Ribbon Development, Optimized Atomization of Magnesium Powder, Titanium Alloy Hearth Melting Processing Technology, Optimized High Strength Lightweight Alloy Welding, and Thin Wall Superalloy Structural Castings. Complete Powder Metallurgy and Materials Initiative. Continue the following joining projects: Weld Residual Stress and Distortion, Titanium Welding, Adhesive Bonding Integrity, Knowledge Based Ultrasonic Testing of Welds, and continue rapid response actions. Continue the following materials processing initiatives: Laser Processing of Nickel Aluminum Bronze, Non-Contact High Speed Gear Inspection, Repair/Refurbishment of Fatigue/Wear Limited Navy Structures, Advanced Manufacturing Processes for the Advanced Amphibious Assault Vehicle, and Manufacturing of High Performance of Transmission Housing. Initiate Femto 2nd Laser project to support the Joint Strike Fighter Office. Initiate project in Propulsor Improvements; Smart Sensors/Actuators; Adaptive Control for Mechanized Welding; Amphibious Assault Vehicle (AAV) Enhanced Armor Kit; Nd:YAG Laser Repair of Catapult Troughs; and Improved Through Thickness Properties of Heavy Gauge Steel.

-- (U) ($6,550) Advanced Manufacturing Enterprise- Continue leveraging the Best Manufacturing Practices and the Acquisition Center of Excellence Acquisition Reform Initiatives. Continue documenting environmental manufacturing and business practices. Continue efforts in shipbuilding and simulation based design. Continue efforts in Shipboard Sensors; Effective Aluminum Catamaran Structures; Chromium Primer for Aluminum Substrates; and the Environmental Resource Information Center. Continue ongoing and initiate new research efforts in support of the Maritime Technology Advanced Shipbuilding Enterprise. Initiate project for Heavy Equipment Repair; Automated Paint Application Containment; Crew Compartment Heater; and AAV Manufacturing Enhancement.

-- (U) ($4,240) Other - Continue projects in the repair technology arena that support the depots and shipyards. Continue the Ammonium Dinitramide; Low Cost and Improved Line Charge Munitions Manufacturing projects in support of energetic materials. Continue Phase III of the F414 Engine Demonstration Device with General

Electric. Continue Production Tooling for Concept 1 Payload in support of Surface Ship Torpedo Defense. Fund technical engineering work at Navy labs and field activities to support Center projects.

-- (U) ($1,269) Portion of extramural program reserved for Small Business Innovation Research Assessment in accordance with 15 U.S.C. 638.

3. (U) FY 2000 PLAN:

- (U) The Navy MANTECH program executes a significant amount of its projects through the Centers of Excellence. The technical efforts performed are reflected throughout the following taxonomy:

-- (U) ($12,750) Composites Processing and Fabrication - Continue work on the Composites Affordability Initiative; the Composites Topside Structures; Enhanced Production Techniques for Low Observable Structures and Materials; Teaching Factory; Rapid Response; Z-Direction Reinforcement for Composite Laminates; Ceramic Matrix Composites; and Resin Transfer Molding. Complete Korex Phase II.

-- (U) ($8,500) Electronics Processing and Fabrication - Continue AEGIS Electronic Demonstration, Flexible Manufacturing of Microwave Power Module Manufacturing, Learning Center and Demonstration Factory, and the Power Electronic Building Blocks Manufacturing plan. Continue electro-optics efforts in Sapphire Domes, Manufacturing Automation of Monolithic Ring Gyros; and initiate efforts for Fiber Optic Velocity Sensors, Remote Source Lighting Technology, Conformal Acoustic Velocity Sensor Accelerometer Manufacturing, Radio Frequency Photonics for Multi-Function Phased Array Antennas, and Affordable Array Technology Tooling.

-- (U) ($18,000) Metals Processing and Fabrication - Continue the following metalworking projects: Centrifugally Cast Titanium/Chromium Bronze Components, Neodymium Ribbon Development, Optimized Atomization of Magnesium Powder, Titanium Alloy Hearth Melting Processing Technology, Optimized High Strength Lightweight Alloy Welding, and Thin Wall Superalloy Structural Castings. Complete Powder Metallurgy and Materials Initiative; Femto 2nd Laser. Continue the following joining projects: Weld Residual Stress and Distortion, Titanium Welding, Adhesive Bonding Integrity, Knowledge Based Ultrasonic Testing of Welds, and continue rapid response actions. Continue the following materials processing initiatives: Laser Processing of Nickel Aluminum Bronze, Non-Contact High Speed Gear Inspection, Repair/Refurbishment of Fatigue/Wear

Limited Navy Structures, Advanced Manufacturing Processes for the Advanced Amphibious Assault Vehicle, and Manufacturing of High Performance of Transmission Housing. Initiate a new joint effort with the Air Force in Metals Affordability.

-- (U) ($6,750) Advanced Manufacturing Enterprise - Continue leveraging the Best Manufacturing Practices and the Acquisition Center of Excellence Acquisition Reform Initiatives. Continue documenting environmental manufacturing and business practices. Continue efforts in shipbuilding and simulation based design. Continue efforts in Shipboard Sensors; Effective Aluminum Catamaran Structures; Chromium Primer for Aluminum Substrates; and the Environmental Resource Information Center. Continue ongoing and initiate new research efforts in support of the Maritime Technology Advanced Shipbuilding Enterprise. Continue efforts in Propulsor Encapsulation.

-- (U) ($10,104) Other - Continue projects in the repair technology arena that support the depots and shipyards such as Supercritical CO2 Parts Cleaning, Ball Valve Repair Process Improvement, Shearography System Development, and Reverse and Re-Engineering Technical Data Generation System. Continue the Ammonium Dinitramide and Composite Propellants projects in support of energetic materials. Continue Phase III of the F414 Engine Demonstration Device with General Electric.

-- (U) ($3,000) Initiate efforts based on the prioritization submitted by the MANTECH Executive Steering Committee. Initiatives will be focused on composites, metals and electronics.

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

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

(U) RELATED RDT&E: Not applicable.

D. (U) SCHEDULE PROFILE: Not applicable.

FY 2000 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050
PROGRAM ELEMENT TITLE: Manufacturing Technology Development PROJECT TITLE: Manufacturing Technology

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

Project Cost Categories	FY 1998	FY 1999	FY 2000
a. Process Development	65,300	55,000	53,617
b. Program Management Support	9,268	3,909	5,487
Total	74,568*	58,909	59,104

*Reflects actual execution. This includes $$22,676 thousand of FY 1997 carryover and $51,892 thousand in FY 1998 funds.

FY 2000 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050
PROGRAM ELEMENT TITLE: Manufacturing Technology Development PROJECT TITLE: Manufacturing Technology

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

PERFORMING ORGANIZATIONS

Contractor/ Government Performing Activity	Contract Method/ Fund Type Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1997 & Prior	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Complete	Total Program
Product Development										
GLCC	C/BAA	1995	CONT.	CONT.	86,928	14,000	14,000	12,000	CONT.	CONT.
CTC	SS/CPFF	1988	CONT.	CONT.	161,495	20,000	15,000	15,000	CONT.	CONT.
EWI	C/BAA	1996	CONT.	CONT.	8,100	3,000	3,000	3,000	CONT.	CONT.
ACI	C/BAA	1995	CONT.	CONT.	9,500	6,000	6,000	6,000	CONT.	CONT.
UNO	C/BAA	1998	CONT.	CONT.	2,000	3,875	4,000	4,000	CONT.	CONT.
PSU	C/CPFF	1997	CONT.	CONT.	3,450	7,000	3,000	3,000	CONT.	CONT.
BFTC	C/CA	1994	CONT.	CONT.	11,881	0	0	0	0	11,881
PTI	C/CPFF	1997	CONT.	CONT.	5,000	5,000	4,500	4,000	CONT.	CONT.
TBD	C/CA	1999	UNK	25,000	0	1,000	4,000	2,500	CONT	CONT.
NSWC-CD	WX	1998	UNK	UNK	1,350	1,398	1,300	1,000	CONT	OCNT
NSWC-IN	WX	1996	UNK	UNK	UNK	3,000	2,000	2,000	CONT.	CONT.
TBD	TBD	TBD	TBD	TBD	0	0	0	3,000	0	0
IPI	C/CPFF	1995	UNK	UNK	4,274	2,700	0	0	0	9,542
Miscellaneous	WX/RC/WR	Various	Various	Various		7,595	2,109	3,604	CONT.	CONT.

Support and Management: Not applicable.

Test and Evaluation: Not applicable.

GOVERNMENT FURNISHED PROPERTY: Not applicable.

FY 2000 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N PROJECT NUMBER: R1050
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	Total FY 1997 & Prior	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Complete	Total Program
Subtotal Product Development	293,978	74,568	58,909	59,104	CONT.	CONT.
Subtotal Support and Management	0	0	0	0	0	0
Subtotal Test and Evaluation	0	0	0	0	0	0
Total Project	293,978	74,568	58,909	59,104	CONT.	CONT.