

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N  
 PROGRAM ELEMENT TITLE: Medical / Dental Engineering

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 ESTIMATE	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
M2650 (Voice Instructional Devices)	0	1,497	0	0	0	0	0	0		
M0933 (Medical Dental Development)	3,106	4,310	4,285	4,400	4,509	4,626	4,727	4,830		
M2443 (Casualty Monitoring)	8,021	0	0	0	0	0	0	0		
M2444 (Navy Telemedicine)	4,529	0	0	0	0	0	0	0		
<b>TOTAL</b>	<b>15,656</b>	<b>5,807</b>	<b>4,285</b>	<b>4,400</b>	<b>4,509</b>	<b>4,626</b>	<b>4,727</b>	<b>4,830</b>		

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M2650 Voice Instructional Devices (VID)	0	1,497	0	0	0	0	0	0		

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item is to develop biomedical equipment and related techniques to reduce morbidity, to enhance the logistic feasibility of modern medical care for combat casualties, to sustain casualties for evacuation to fixed medical facilities for definitive care, and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a documented, authenticated military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms / industry participation in the projects.

(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 1999 PLAN:

- (U) (\$1,460) VOICE INSTRUCTIONAL DEVICES (VID): This is a Congressional increase. Initial effort will be to modify the Army-developed device to meet Navy Medical requirements on ships and in the field. Subsequently, the prototype device will undergo a series of tests and evaluations in a field and shipboard environment.
- (U) (\$37) SMALL BUSINESS INNOVATION RESEARCH (SBIR): Portion of extramural program reserved for SBIR assessment in accordance with 15 USC 638.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
(U) President's Budget:	0	0	0
(U) Adjustments from FY 1999 PRESBUDG:	0	1,497	0

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(U) FY 2000 / 2001 President's Submission 0 1,497 0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1999: increase of (1,500) due to Congressional add for Voice Instructional Devices (VID); decrease of (-3) due to revised economic assumptions.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

(U) COST: (Dollars in Thousands)

PROJECT NUMBER &	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
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BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N  
 PROGRAM ELEMENT TITLE: Medical / Dental Engineering

TITLE	ESTIMATE	COMPLETE	PROGRAM							
M0933 Medical / Dental Equipment Development	3,106	4,310	4,285	4,400	4,509	4,626	4,727	4,830		

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item is to develop biomedical equipment and related techniques to reduce morbidity, to enhance the logistic feasibility of modern medical care for combat casualties, to sustain casualties for evacuation to fixed medical facilities for definitive care, and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a documented, authenticated military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms / industry participation in the projects.

(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) (\$209) HEARING PROTECTION: Developed low-cost, high efficiency hearing protection. Potential benefit is \$48M per year navy Department VA claims, \$8M per year navy civilian claims. Patents and licenses will be enormously valuable.
- (U) (\$434) BLOOD AND BLOOD PRODUCTS: Continued advancement of freeze-dried technology with clinical trials and transition to a major pharmaceutical company now taking primary responsibility for freeze-dried platelets. Developed Good manufacturing Practices (GMP) procedure concept for LEH blood substitutes, including safety and efficacy tests. Initiated use of Navy / Army Hemoglobin Production Facility for encapsulated blood substitutes.
- (U) (\$1,212) ADVANCED FROZEN RED CELL WASHER / CLOSED LOOP BLOOD PROCESSOR: Developed initial prototype of red cell washer to clear cryoprotectant from thawed frozen banked blood. Gulf War lesson: need for automation and greater throughput. Joint Navy / Army effort.
- (U) (\$450) SPATIAL DISORIENTATION / VESTIBULAR VEST: Two devices for novel vestibular tests have been designed and either built or contracted out for development.
- (U) (\$440) TELEMEDICINE: Began the development and integration of the Medical Information Management System (MIMS) to be deployed on tactical ships with medical responsibilities.
- (U) (\$204) ACTIVE NOISE CANCELLATION STETHOSCOPE: Designed test chamber to evaluate hardware as it becomes available for testing.

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- (U) (\$157) MEDICAL WARGAMING: Began the development of medical wargaming models to interface with line wargaming for readiness planning, training, rehearsal, and assessment. Completed the first medical oriented wargame.

2. (U) FY 1999 PLAN:

- (U) (\$323) ENHANCED HEARING PROTECTION: Continue transition and testing of developed passive hearing protection material to Navy / Marine Corps application. Continue refinement of development items.
- (U) (\$1,633) ADVANCED FROZEN RED CELL WASHER / CLOSED LOOP BLOOD PROCESSOR: Continue advanced development and testing of automated red cell washer to deglycerolize (remove cryoprotectant) the thawed blood and resuspend the red cells for transfusion. Finalize prototype based on testing and updated FDA requirements for approval of the prototype system.
- (U) (\$422) SPATIAL DISORIENTATION / VESTIBULAR VEST: Two devices for novel vestibular tests have been designed and either built or contracted out for development.
- (U) (\$492) TELEMEDICINE: Complete development of clinical testing of aviator spatial disorientation. Begin demonstration to the operational forces and initial implementation into standard testing procedures with any necessary protocol and equipment refinement.
- (U) (\$269) ACTIVE NOISE CANCELLATION STETHOSCOPE: Continue development of medical stethoscope device for cardiac monitoring in high noise shipboard and combat environments.
- (U) (\$287) POTABLE WATER TESTING: Initiate development of simple, portable device for testing potable water quality for use in combat environments.
- (U) (\$403) UNDERWATER SOUND PROTECTION: Begin protection from bioeffects for divers exposed to intense underwater sound. There is no means to monitor Low Frequency Acoustic Active Sonar exposure on submerged divers.
- (U) (\$439) LASER THREAT ANALYSIS: Begin development of mission planning tools needed to minimize the emerging threat of man portable lasers to aircrews.
- (U) (\$42) CARBON DIOXIDE SENSOR: Begin development of carbon dioxide sensor for Fleet divers.

2. (U) FY 2000 PLAN:

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DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N  
PROGRAM ELEMENT TITLE: Medical / Dental Engineering

- (U) (\$138) ENHANCED HEARING PROTECTION: Complete transition and testing of developed passive hearing protection material to Navy / Marine Corps applications.
- (U) (\$1,242) ADVANCED FROZEN RED CELL WASHER / CLOSED LOOP BLOOD PROCESSOR: Complete advanced development and testing of automated red cell washer to remove cryoprotectant from the thawed blood and resuspend the red cells for transfusion. Complete prototype testing and FDA approvals for industry manufacturing and use by military blood banks.
- (U) (\$522) SPATIAL DISORIENTATION / VESTIBULAR VEST: Complete demonstration to the operational forces of system effectiveness and complete implementation into standard procedures with continued monitoring of utilization and effectiveness.
- (U) (\$480) TELEMEDICINE: Complete the development and integration of the Medical Information Management System (MIMS) to be deployed on tactical ships with medical responsibilities.
- (U) (\$385) ACTIVE NOISE CANCELLATION STETHOSCOPE: Complete development of medical stethoscope device for cardiac monitoring in high noise shipboard and combat environments.
- (U) (\$345) POTABLE WATER TESTING: Continue development of simple, portable device for testing potable water quality for use in combat environments.
- (U) (\$552) UNDERWATER SOUND PROTECTION: Complete development of protection from bioeffects for divers exposed to intense underwater sound.
- (U) (\$345) LASER THREAT ANALYSIS: Begin development of mission planning tools needed to minimize the emerging threat of man portable lasers to aircrews.
- (U) (\$276) CARBON DIOXIDE SENSOR: Continue development of a sensor / alarm system to warn of hazardous CO<sub>2</sub> levels in the closed-circuit rebreathers worn by divers on SPECWAR, EOD and mine countermeasure missions.

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B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
(U) President's Budget:	3,513	4,321	4,342
(U) Adjustments from FY 1999 PRESBUDG:	-407	-11	-57
(U) FY 2000 / 2001 President's Submission	3,106	4,310	4,285

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding:

(U) FY 1998: decrease of (-407) for FY 1998 Actual updatee.

(U) FY 1999: decrease of (-10) for Sec. 8108 Revised Economic Assumption; decrease of (-1) for Civilian Personnel Underexecution.

(U) FY 2000: decrease of (-62) for Non Pay Inflation; increase of (8) for NWCF Rates - NCCOSC; increase of (3) for Civilian Pay Rates.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

(U) COST: (Dollars in Thousands)

PROJECT NUMBER &	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
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TITLE	ESTIMATE	COMPLETE	PROGRAM								
M2443 Casualty Monitoring	8,021	0	0	0	0	0	0	0	0		

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item is to develop biomedical equipment and related techniques to reduce morbidity, to enhance the logistic feasibility of modern medical care for combat casualties, to sustain casualties for evacuation to fixed medical facilities for definitive care, and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a documented, authenticated military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms / industry participation in the projects.

(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

(U) (\$8,021) CASUALTY MONITORING AND STABILIZATION: Coordination has taken place with several hospitals to collect heart rate variability data in trauma patients. Contracts for supply of components for a diagnostic glove have been negotiated. Plans to expand efforts in suspended animation are being developed.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
(U) President's Budget:	8,021	0	0
(U) Adjustments from FY 1999 PRESBUDG:	0	0	0
(U) FY 2000 / 2001 President's Submission	8,021	0	0

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Not applicable.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.

(U) COST: (Dollars in Thousands)

PROJECT NUMBER &	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL

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Exhibit R-2a

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DATE: January 1999

BUDGET ACTIVITY: 5 PROGRAM ELEMENT: 0604771N  
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TITLE	ESTIMATE	COMPLETE	PROGRAM								
M2444 Telemedicine	4,529	0	0	0	0	0	0	0	0		

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The purpose of this item is to develop biomedical equipment and related techniques to reduce morbidity, to enhance the logistic feasibility of modern medical care for combat casualties, to sustain casualties for evacuation to fixed medical facilities for definitive care, and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a documented, authenticated military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms / industry participation in the projects.

(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) (\$4,529) TELEMEDICINE: There are several items of progress to report for this Congressional plus-up. An Analytic Plan has been developed for the proposed Joint Medical Operations - Telemedicine ACTD. Measures of effectiveness, success and performance have been identified for evaluating the insertion of telemedicine capability into operational medicine. An exercise plan has been created to evaluate the technical performance of the component devices.

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
(U) President's Budget:	4,529	0	0
(U) Adjustments from FY 1999 PRESBUDG:	0	0	0
(U) FY 2000 / 2001 President's Submission	4,529	0	0

(U) CHANGE SUMMARY EXPLANATION:

- (U) Funding: Not applicable.
- (U) Schedule: Not applicable.

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PROGRAM ELEMENT TITLE: Medical / Dental Engineering

(U) Technical: Not applicable.

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

(U) RELATED RDT&E:

(U) Program Element 0603706N, Medical Development.

D. (U) SCHEDULE PROFILE: Not applicable.