

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE
February 1999

BUDGET ACTIVITY
2 - Exploratory Development

PE NUMBER AND TITLE
**0602131M Marine Corps Landing force
Technology**

PROJECT
C3001

COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
C3001 Marine Corps Landing Force Technology	12478	12970	10534	9867	11653	11715	11936	12202	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

A. (U) Mission Description and Budget Item Justification:

(U) The basic roles and missions of the Marine Corps (the seizure and defense of advanced naval bases, the conduct of land operations essential to the naval campaign, and other such duties as the President may direct) are specified in Title 10 USC 5063. The National Security Act of 1947 and DoD Directive 5000.1 are the basis for conducting this Marine Corps effort.

(U) By law, the Marine Corps is tasked to develop, in conjunction with the Army and Air Force, those phases of amphibious operations that pertain to tactics, techniques, and equipment used by the landing force. This program element (PE) is executed under project MQ1A. It is organized into five Warfighting Imperatives by the Science and Technology (S&T) Roundtable process. These Warfighting Imperatives are: Command and Control, Maneuver, Logistics, Firepower, and Training and Education.

(U) The primary objective of this Program Element (PE) is to develop and demonstrate the technologies needed to meet the Marine Corps unique responsibility for amphibious warfare and subsequent operations ashore. This PE provides the knowledge base to support Advanced Technology (6.3) and is the technology base for future amphibious/expeditionary warfare capabilities. This PE supports the Concept Based Requirements System of the Marine Corps Combat Development Center (MCCDC) and responds directly to the USMC S&T Roundtable process managed by MCCDC and Marine Corps Systems Command.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is budgeted within the Applied Research Budget Activity because it investigates technological advances with possible applications toward solution of specific Marine Corps problems, short of a major development effort.

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(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) **FY 1998 Accomplishments:**

- (U) \$ 3249 Maneuver Imperative: Completed Preliminary Design of tunable filter multi-spectral camera upgrade for mine detection and processing software development and transitioned to Coastal Battlefield Reconnaissance and Assessment (COBRA) ATD; multi-spectral laser diode array for night illumination were designed and fabricated. Completed Technical Assessment of the Small Unit Riverine Craft (SURC). Completed Technical Configuration Description of SURC to support Technology Demonstrator craft in FY99 and support USMC Riverine Center of Excellence for future operational concept development. Completed Technical Analysis of Mine Countermeasure systems that can be applied to Marine Corps Ground Combat vehicles to support on-the-move, In-Stride mine countermeasure. Completed Technical Analysis of Urban Warfare mobility study to address systems that can be applied to Marine Corps Ground Combat vehicles to support enhanced operations in urban environments. Continued long term corrosion exposure testing of materials, components and coatings that will be on future USMC platforms. Findings from 30 month exposure test supported the USMC Advanced Amphibious Assault Vehicle (AAAV) program in hull material downselection and provided a cost avoidance of greater than \$50 million, in addition to Logistical Vehicle System Replacement (LVSR) and Medium Tactical Vehicle Replacement (MTVR). Helo-Transportable Tactical Vehicle participated in USMC STEEL KNIGHT exercise, US Special Operations exercises, and USMC Urban Warrior Limited Objective Exercises. These exercises support the operational capabilities definition for the Reconnaissance, Surveillance and Targeting Vehicle (RST/V) program. Completed Hull Life Analysis of the USMC Family of Light Armored Vehicles (LAV). This analysis supports the PMs acquisition plan to conduct a 10 year Service Life Extension Program. Completed testing and reporting of Joint Advanced Survivability Experiment program (classified).
- (U) \$ 1999 Firepower Imperative: Continued development of sensor testbed (alignment/registration). Investigated sensor-to-shooter fire control systems integration. Demonstrated non-magnetic North-finding Azimuth systems. Investigated target discrimination systems integration into Advanced Field Artillery Tactical Data System (AFATDS). Investigated and demonstrated technology to Enhanced Target Acquisition and Location (ETALS) (formerly Forward Observer/Forward Air Controller (FO/FAC)). Investigated advanced small arms weapons systems. Demonstrated fire-from-enclosure technology for shoulder launched weapons systems. Continued Broad Area Announcement (BAA) solicitation/award cycle. Began integration of sensor technology into prototype Remote Reconnaissance Tactical Vehicle (RSTV).

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- (U) \$ 2958 Command and Control Imperative: Completed requirement analysis and technology assessment for synchronizing information in order to achieve a federated database capability, developed necessary algorithms, and initiated the prototype design. Developed Communications Program Plan and strategy for the analysis and evaluation of DoD Mobile Network Radio programs. The analysis included verification modeling capability for mobile network radios to ensure they meet USMC requirements. Conducted analyses of potential candidate systems and prepared technical specifications for prototype system requirements. Completed the development of the Smart Tactical Jammer by expanding the spectrum of signals that can be attacked to include cellular and Personal Communications Systems (PCS). Initiated the development of a family of light weight expendable jammers using technology developed by the Cellular/PCS industry. Conducted analyses and developed a conceptual design for a Time Difference of Arrival (TDOA) system for precision location of communication transmitters. Initiated the development of software tools to provide USMC Commanders with decision support aids for battlefield decision making and programs to automatically generate, process and transfer Target List information to AFATDS and Contingency Theater Automated Planning System (CTAPS). Evaluated Commander's Critical Information Requirements Enhancement tools. Enhanced Unit Operation Center concept development.
 - (U) \$ 3372 Logistics Imperative: Continued system development of Logistics Information Systems which focused on decision support tools and data warehousing. Decision support tool technology exploration through the BAA process included the use of neural networks, expert agents, mathematical modeling, spreadsheet modeling, and spares based modeling to increase visibility into the logistics picture. Data warehousing technologies included smart notification and data push, data warehouse modules to facilitate mining from mainframe legacy systems and technology to maintain data integrity, and web server architectures that can support both upper and lower command structures in a deployed environment. Developed bulk liquids technologies in support of future seabasing concept development, focused on innovation in packaging and distribution. Continued modeling and simulation support and technology development plan for future mission area analysis. Explored new technologies for high power density generators and deployable power distribution. Explored new technologies for expeditionary washdown. Supported transition of validated logistics equipment systems evolving through Advanced Warfighting Experiments.
 - (U) \$ 900 Training and Education Imperative: Continued Rapid Virtual Data Base development. Developed intelligent automated forces. Continued training technology concept development. Began Integrated Family of Simulators concept development. Initiated efforts in Small Unit Tactical Training (SUTT).
- (U)Total \$ 12478

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C3001**(U) FY 1999 Planned Program:**

- (U) \$ 3464 Maneuver Imperative: Conduct risk reduction for the RST/V platform and payload integration. Complete integration of survivability technology with RST/V and LAV and tested. Fabricate, integrate and test tunable filter multi-spectral camera upgrade for COBRA enhanced detection capability. Complete mine detection processing software development and test. Initiate investigation leading to the technology to enhance mobility of tactical systems. Continue corrosion and materials research and testing with insertion of technologies in Light Armored Vehicle/Medium Tactical Vehicle Replacement/Logistics Vehicle System (LAV/MTVR/LVS). Complete market survey of commercial craft and propulsion components to satisfy the Small Unit Riverine Craft (SURC). Conduct detailed analysis and modeling of notional solutions to support Mine Countermeasure systems that can be applied to Marine Corps Ground Combat vehicles to support on-the-move, in-stride mine countermeasure. Prepare acquisition plan and supporting documents for commencement of developmental program to test hardware in FY00/01. Conduct joint planning with US Army to leverage existing or non-developmental items to USMC needs. Continue long term corrosion exposure testing of materials, components and coatings that will be on future USMC platforms. Conduct in-field testing of advanced components and coatings on light and medium tactical vehicles. Helo-Transportable Tactical Vehicles participating in USMC Urban Warrior Advanced Warfighting Experiment and support Light Strike Vehicle acquisition program with Operational Evaluation and technical requirement assessments. Develop advanced hardware/software components for intergration and transition into ongoing acquisition efforts for the Coastal Battlefield Reconnaissance and Analysis (COBRA).
- (U) \$ 2178 Firepower Imperative: Continue advanced lightweight weapons advanced technology efforts. Continue sensor integration technology efforts. Demonstrate advanced Enhanced Target Acquisition and Location technology. Continue sensor technology integration into RSTV.
- (U) \$ 3590 Command and Control Imperative: Support USMC requirements for Joint Networked Radios by prototyping modules and capabilities that the USMC will insert into the requirements of the Joint Program Office. Demonstrate communication technologies that are of high relevance to evolving USMC warfighting objectives for possible insertion into joint communication requirements. Field demonstrated capability to jam cellular and other PCS devices that may be utilized for military purposes. Demonstrate technology capability for further miniaturization of expendable jammers. Field test target management capability for AFATDS and CTAPS and evaluate the requirement for targeting deconfliction including Naval surface fires in a USMC target management system. Assess the requirement and benefits of converting software developments to evolving Windows NT interface capabilities being made available by Marine Corps Tactical System Support Activity (MCTSSA) and Defense Information Systems Agency (DISA).

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- (U) \$ 2350 Logistics Imperative: Continue system development of Logistics Information Systems, focusing on decision support tools and data warehousing. Incorporate technology for asset visibility, to include warranty tracking of high dollar items, electronic issue and direct vendor support for supply. Continue to develop bulk liquids technologies in support of future seabasing concept development, focusing on innovation in packaging and distribution. Additional attention will be focused on addressing the seamless Naval movement of bulk liquids from ship to shore, to include water, and to include unit issue or water in an NBC environment. Concept exploration in precision logistics, including containerized deployable warehousing, concept exploration for technologies to improve vehicle supportability over the full life cycle, and integrated diagnostics.
 - (U) \$ 1264 Training and Education Imperative: Continue Rapid Virtual Data Base development. Continue development of intelligent automated forces and test and operational simulations. Continue training technology concepts development. Continue Integrated Family of Simulators development and test with Closed Loop Artillery Simulator (CLAS), Combat Vehicle Trainer (CVT). Continue efforts in Small Unit Tactical Training (SUTT).
 - (U) \$ 124 Portion of extramural program reserved for Small Business Innovation Research (SBIR) assessment in accordance with 15 USC 638.
- (U)Total \$ 12970

(U) FY 2000 Planned Program:

- (U) \$ 3284 Maneuver Imperative: Conduct risk reduction for the RST/V platform and payload integration. Complete integration of survivability technology with RST/V and LAV and test. Complete integration and testing of enhanced minefield multi-spectral sensor, illuminator and processor. Test technology to enhance mobility of tactical systems. Continue corrosion and materials research and testing with insertion of technologies in LAV/MTVR/LVS. Begin design for advanced Mine Countermeasure systems that can be applied to Marine Corps Ground Combat vehicles to support on-the-move, In-Stride mine countermeasure. Continue long term corrosion exposure testing of materials, components and coatings that will be on future USMC platforms. Helo-Transportable Tactical Vehicles participating in USMC Capable Warrior Limited Objective Experiments and Extending the Littoral Battlespace ACTD experiments acting as surrogate platform for RST-V ATD.
- (U) \$ 1000 Firepower Imperative: Continue sensor integration technology efforts. Demonstrate advanced ETALS technology. Demonstrate sensor technology integration into RSTV.
- (U) \$ 2850 Command and Control Imperative: Demonstrate TDOA location finding in field tests with both USMC and Joint data link connectivity and fusion of data. Provide integrated intelligence database object manipulation for more realistic threat representations than icon presentations. The intelligence database presentations shall support both local and theater entries. Extend web based interfaces to tactical computer applications for selected visibility at lower echelons.

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- (U) \$ 2316 Logistics Imperative: Continue logistics technology efforts in direct support of emerging USMC logistics system and requirements. Continue specific technology development and insertion in the areas of Logistics Information Resources and Precision Logistics. Continue rapid prototype and experimentally validated logistics equipment concepts into Marine Corps acquisition programs.
 - (U) \$ 1084 Training and Education Imperative: Complete Rapid Virtual Data Base development and demo. Continue development of intelligent automated forces and test and operational simulations. Continue training technology concepts development. Continue Integrated Family of Simulators development and test with the Small Unit Tactical Trainer (SUTT). Initiate efforts in training technology.
- (U)Total \$ 10534

B. (U) Project Change Summary

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
(U) Previous President's Budget	13458	12132	10609
(U) Adjustments to Previous President's Budget	-980	+838	-75
(U) Current Budget Submit	12478	12970	10534

(U) Change Summary Explanation:

(U) Funding: FY98 decreases and increases are due to reprioritization of programs within the Marine Corps. FY 1999 increases and decreases reflect a Congressional increase of One (1) million dollars for advanced hardware/software development for COBRA and minor affordability adjustments in the amount of 162 thousand. FY 2000 decrease is due to revised economic adjustments.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) Other Program Funding Summary
(APPN, BLI #, NOMEN)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
Not applicable.									<u>Compl</u>	<u>Cost</u>

(U) Related RDT&E

(U) This program adheres to Tri-Service Reliance Agreements in Chemical/Biological Defense; Command, Control and Communications; Conventional Air/Surface Weaponry; Electronic Devices; Ground Vehicles; Ships and Watercraft; Manpower and Personnel; and Training Systems.

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- (U) PE 0603606A (Improved Dispersed Explosives Technology)
- (U) PE 0603619A (Improved Dispersed Explosives Technology)
- (U) PE 0603611M (Marine Corps Assault Amphibious Vehicles)
- (U) PE 0603612M (Marine Corps Mine/Countermeasures Systems)
- (U) PE 0206623M (Marine Corps Ground Combat/Supporting Arms Systems)
- (U) PE 0206624M (Marine Corps Combat Services Support)
- (U) PE 0603635M (Marine Corps Ground Combat/Supporting Arms Systems)
- (U) PE 0603640M (Marine Corps Advanced Technology Demonstrations)
- (U) PE 0602232N (Space and Electronic Warfare (SEW) technology)
- (U) PE 0603782N (Shallow Water Mine Countermeasures Demonstrations)
- (U) PE 0206313M (Marine Corps Air Ground Task Force Command/Control/Comm/Computers & Intel (MAGTF C4I))
- (U) The Army, Air Force, and Navy Technology Base Programs are monitored by Marine Corps Project Officers through their counterparts in those organizations to ensure that no unwarranted duplication exists.

D. (U) Schedule Profile: Not applicable.

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