

**UNCLASSIFIED**

FY 2002 RDT&E, N BUDGET ITEM JUSTIFICATION SHEET

DATE: June 2001

BUDGET ACTIVITY: 2      PROGRAM ELEMENT: 0602131M  
PROGRAM ELEMENT TITLE: Marine Corps Landing Force Technology

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE
Marine Corps Landing Force Technology	17,233	12,180	31,248

(U) The Marine Corps is tasked to develop, in conjunction with the Navy, Army, and Air Force, those phases of amphibious operations that pertain to tactics, techniques, and equipment used by the landing force. It is organized into five Amphibious Expeditionary Warfighting Capabilities. These Amphibious Expeditionary Warfighting Capabilities are: Maneuver, Firepower, Command and Control, Logistics, and Training and Education.

(U) The primary objective of this 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 Command and responds directly to the USMC Science and Technology process. Due to the number of efforts in this PE, the programs described are representative of the work included in this PE.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is budgeted within APPLIED RESEARCH, Budget Activity, because it investigates technical advances with possible applications toward solution of specific Naval Amphibious Expeditionary Warfighting problems, short of a major development effort.

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(U) PROGRAMS PLANS AND ACCOMPLISHMENTS:

MANEUVER	FY00 \$6,634	FY01 \$2,436	FY02 \$1,393
Initiate	<ul style="list-style-type: none"> <li>Integration of laser illuminators with airborne multi-spectral mine detector</li> </ul>	<ul style="list-style-type: none"> <li>Airborne testing of TFMC</li> <li>Multi-sensor data fusion algorithm development</li> <li>Unmanned ground vehicle technology assessment</li> <li>Lightweight armor/structural materials development</li> </ul>	<ul style="list-style-type: none"> <li>Lightweight vehicle power technologies</li> <li>Advanced vehicle mobility</li> </ul>
Continue	<ul style="list-style-type: none"> <li>Field testing of Tunable Filter Multi-spectral Camera (TFMC)</li> <li>Algorithm development for automatic target recognition/mine detection</li> <li>Transition of data to Coastal Battlefield Reconnaissance and Analysis (COBRA) program Mine Countermeasures(MCM) Future Naval Capability (FNC)efforts</li> <li>Light vehicle survivability studies and urban terrain modeling</li> </ul>	<ul style="list-style-type: none"> <li>Integration of laser illuminators &amp; TFMC</li> <li>Algorithm development for automatic target recognition/mine detection</li> <li>Light vehicle survivability studies and urban terrain modeling</li> </ul>	<ul style="list-style-type: none"> <li>Test-bed flight testing of TFMC and laser illuminators</li> <li>Algorithm development for automatic target recognition/mine detection</li> <li>Light vehicle survivability development</li> <li>Lightweight armor/structural materials development</li> </ul>
Complete	<ul style="list-style-type: none"> <li>Acceptance lab testing of TFMC, hybrid laser and laser diode array illuminators</li> </ul>	<ul style="list-style-type: none"> <li>Static field testing of TFMC</li> <li>Transition of data to COBRA program/MCM FNC efforts</li> </ul>	<ul style="list-style-type: none"> <li>Urban mobility modeling</li> <li>Unmanned ground vehicle technology assessment</li> </ul>

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FIREPOWER	FY00 \$1,553	FY01 \$1,828	FY02 \$6,940
Initiate	<ul style="list-style-type: none"> <li>Multi Role Radar System (MRRS) integration study</li> </ul>		<ul style="list-style-type: none"> <li>Evaluate alternative methods of integration of low cost mobile sensor and missile system components into advanced combat systems</li> <li>Identify required command and control integration risks</li> </ul>
Complete	<ul style="list-style-type: none"> <li>TEAMS Modeling &amp; simulation of sensor to shooter high-level architectureT-3 connectivity for Testing Evaluation Assessment Modeling and Simulation (TEAMS) facility</li> </ul>	<ul style="list-style-type: none"> <li>MRRS integration study Transitions to Missile Defense (MD) FNC for inclusion in 6.3 MD FNC program</li> </ul>	

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COMMAND AND CONTROL	FY00 \$3,877	FY01 \$2,411	FY02 \$3,748
Initiate			<ul style="list-style-type: none"> <li>• Mobile Networking: Begin development of advanced expeditionary networking management tools and protocols in support of Information Distribution Future Naval Capability (FNC) and JTRS. Initiate conformal vehicle antenna effort in support of JTRS.</li> <li>• Intel: Reinitiate TDOA effort. Examine methods of data file size reduction such as feature extraction.</li> <li>• Computer Technolgies: Initiate high-density date storage applied research program. Build initial prototype device for testing purposes.</li> <li>• Computer Software: Initiate Advanced Computing Technology to examine methods of distributed database synchronization and statistical trend analysis.</li> </ul>
Continue	<ul style="list-style-type: none"> <li>• Continued development of Marine Corps specific</li> </ul>	<ul style="list-style-type: none"> <li>• Devise JTRS Software Communications Architecture</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile Networking: Continue JTRS architecture and modeling</li> </ul>

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	<p>requirements and network modeling capabilities in support of the Joint Tactical Radio System (JTRS) Program</p> <ul style="list-style-type: none"> <li>• Developed JTRS wideband wearable antennas for use with man-pack and hand-held variants based on FY99 feasibility studies.</li> <li>• Two-station, PC-based, portable time-difference of arrival (TDOA)—define architecture, research processing and location techniques and initiate development of processing package.</li> <li>• PC-based Mobile Direction Finding (MDF)—research automated classification methods; research real-time antenna orientation method; develop architecture; initiate prototype development and system integration</li> </ul>	<p>version 1.0 Standard</p> <ul style="list-style-type: none"> <li>• Inject Marine Corps specific requirements into and perform network modeling of proposed JTRS Program wide-band network waveforms (WNW); begin JTRS WNW standardization process</li> <li>• Prototype and system development of JTRS wide-band wearable antennas. Develop Cooperative Research and Development Agreement</li> <li>• Continue TDOA processing package development and technology demonstrations.</li> <li>• MDF—complete prototype development and system integration; demonstrate system</li> </ul>	<p>efforts. Select WNW standard 1.0.</p> <ul style="list-style-type: none"> <li>• Intel: Continue MDF refinement in concert with TDOA effort.</li> </ul>
Complete			<ul style="list-style-type: none"> <li>• Intel: Transition selected capabilities to Advanced Technology Development for Team Portable Collection System</li> </ul>

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			<ul style="list-style-type: none"> <li>• Mobile Networking: JTRS Wearable Antenna: perform antenna pattern analysis for different antenna/Marine orientations. Write Final Report.</li> </ul>
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LOGISTICS	FY00 \$3,274	FY01 \$2,436	FY02 \$2,167
Initiate	<ul style="list-style-type: none"> <li>• Initiate efforts to expand logistics capabilities to accommodate emerging concepts of employment and evolving sea base platforms by developing Tactical Logistics Model</li> </ul>	<ul style="list-style-type: none"> <li>• Packaging initiatives to conform to seabased, unitized loading, air delivery systems characteristics trade off analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate Expeditionary Energy technologies and alternative power sources to reduce logistics demand</li> </ul>
Continue	<ul style="list-style-type: none"> <li>• Continued system development of Logistics Information Systems, focusing on decision support tools and data warehousing</li> <li>• Continued corrosion and materials research and testing with insertion of technologies in Light Armored Vehicle/Medium Tactical Vehicle Replacement/Logistics Vehicle System (LAV/MTVR/LVS)</li> <li>• Continue development of fuel quantity sensors</li> <li>• Continued use and testing of</li> </ul>	<ul style="list-style-type: none"> <li>• Logistics Information System development, assessment of military utility.</li> <li>• Continue development and testing of fuel quality and quantity sensors, fuel reconditioning capabilities</li> <li>• Continue development of Onboard Vehicle Refueler Communication System and its link to the Logistics Information System</li> </ul>	<ul style="list-style-type: none"> <li>• Continue development and testing of fuel automated quantity sensors with link to Logistics Information System</li> <li>• Continue development of Onboard Vehicle Refueler Communication System and its link to the Logistics Information System.</li> <li>• Add software modules for Logistics Information System.</li> <li>• New materials for reduced tare and flexible packaging</li> </ul>

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	Tactical Logistics Model		
Complete		<ul style="list-style-type: none"> <li>Finalize software coding on Tactical Logistics Model</li> <li>Complete corrosion and materials research for inclusion in Total Ownership Cost FNC starting in 02</li> </ul>	

TRAINING AND EDUCATION	FY00 \$1,895	FY01 \$2,801	FY02 \$2,000
Initiate	Marine Air Ground Task Force Federated Object Model (MAGTF FOM) <ul style="list-style-type: none"> <li>Develop MAGTF FOM) Ver. 0.1</li> <li>Develop scenario for FOM Demo</li> <li>Identify Demo options for Ver. 1.0</li> <li>Identify interface Control Documents</li> <li>Describe system behavior</li> <li>Identify Real-Time Platform-Level Reference (RPR) attributes</li> <li>Develop Federation Agreements /Interface Document (FAID) Tactical Decision-Making Games (TDG)</li> </ul>	MAGTF FOM <ul style="list-style-type: none"> <li>Develop Supportability Estimates for incorporating the MAGTF FOM into training systems (emerging and existing)</li> <li>Determine Tech. Feasibility for incorporation of MAGTF FOM into existing training system.</li> <li>Transition Plans to go to 6.3 and programs (e.g., Closed-Loop Artillery Simulations System (CLASS), Combat Vehicle Appended Trainer (CVAT), etc.)</li> <li>TDG Close Combat-Marine Prototype design</li> <li>Beta Prototypes on MAGTF XXI</li> </ul>	MAGTF FOM <ul style="list-style-type: none"> <li>Transition to MARCORSSYSCOM (PMTRASYS) for MAGTF FOM 1.0 development and Proof of Concept demonstration.TDG</li> <li>Transition to Training and Education 6.3.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Tactical Decision-Making Games MAGTF XXI Prototype. Simulation Based Acquisition (SBA) Toolkit</li> <li>• Survey of logistics throughput models for possible inclusion in toolkit</li> </ul>	<ul style="list-style-type: none"> <li>• Testing on MAGTF XXI</li> <li>• Development of After Action Review capability for MAGTF XXI.</li> <li>• Transition Plan to go to 6.3</li> </ul>	
Continue	<p>MAGTF FOM</p> <ul style="list-style-type: none"> <li>• Conduct Design Reviews to ensure all requirements for the different platforms are addressed</li> <li>• ID/Approve RPR attributes</li> <li>• Develop a draft Concept of Demonstration Plan</li> <li>• Develop a draft Baseline Interoperability Spec</li> </ul> <p>TDG</p> <ul style="list-style-type: none"> <li>• Develop an Alpha Prototype for evaluation.</li> </ul> <p>SBA Toolkit</p> <ul style="list-style-type: none"> <li>• Develop models for virtual urban proving ground</li> </ul>	<p>MAGTF FOM</p> <ul style="list-style-type: none"> <li>• Develop MAGTF FOM Ver. 0.2 and follow-on ver. To Ver. 1.0</li> <li>• Finalizing the Baseline Interoperability Spec</li> <li>• Review the draft Concept of Demonstration Plan</li> <li>• Develop Federation Agreements /Interface Document (FAID)</li> <li>• Develop Supportability estimates report</li> <li>• Develop technology feasibility report</li> <li>• Develop Transition Plan</li> </ul> <p>TDG</p> <ul style="list-style-type: none"> <li>• Evaluate Tactical Decision-Making Games MAGTF XXI Beta Prototype</li> <li>• Develop Control Features on Marine 2000</li> <li>• Develop Scenarios/Missions on</li> </ul>	

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		<p>Marine 2000</p> <ul style="list-style-type: none"> <li>• Develop Regiment-Level Commands Marine 2000.</li> <li>• Develop Transition Plan SBA Toolkit</li> <li>• Integration of mine blast prediction and survivability models into dynamic modeling toolkit</li> </ul>	
<p>Complete</p>	<p>MAGTF FOM</p> <ul style="list-style-type: none"> <li>• Draft MAGTF FOM Version 0.1 released for staffing</li> <li>• Scenario development</li> <li>• Demo options approved TDG</li> <li>• Alpha Prototype. SBA Toolkit</li> <li>• Survey of potential mine blast prediction and survivability models for possible integration into dynamic modeling toolkit.</li> <li>• Urban obstacle characterization</li> </ul>	<p>MAGTF FOM</p> <ul style="list-style-type: none"> <li>• Scenario Developed</li> <li>• Release Ver. of MAGTF FOM 0.X for final staffing</li> <li>• Detailed Concept of Demo Plan approved</li> <li>• Baseline Interoperability Spec approved</li> <li>• Transition Plans approved TDG</li> <li>• Transition MAGTF XXI to MC University.</li> <li>• Tactical Decision-Making Games Marines 2000 Alpha Prototype</li> <li>• 6.3 Transition Plan approved SBA Toolkit</li> <li>• Survey of logistics throughput models</li> </ul>	

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		<ul style="list-style-type: none"> <li>• Demonstrate models for urban proving ground</li> <li>• Transition Plan approved</li> </ul>	
SBIR	FY00	FY01 \$268	FY02
		<ul style="list-style-type: none"> <li>• Portion of FY01 extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 328</li> </ul>	

Littoral Combat and Power Projection Future Naval Capability	FY00	FY01	FY02 \$15,000
Initiate			<ul style="list-style-type: none"> <li>• Initiate Littoral Combat Future Naval Capability to provide combatant commanders with scalable, interoperable, combined arms Marine Air Ground Task Forces; Naval Expeditionary Forces ready to fight and prevail, and shape the national security environment.</li> </ul>

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			Developmental efforts will optimize the Marine Corps' operating forces, support and sustainment base, and its unique capabilities to respond to the complex spectrum of crises and conflicts.
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(U) PROGRAM CHANGE SUMMARY:

	FY 2000	FY 2001	FY 2002
FY 2001 President's Budget	17,437	9,793	11,539
Appropriated Value:			
Adjustments from FY 2001 President's Budget:			
Congressional Plus-ups		+2,500	
Congressional Rescission	-68	-113	
NWCF Rate Adjustment			-55
SBIR/STTR Transfer	-259		
PE Rebalance			+4,740
Non-Pay Inflation			+24
Program Adjustment	+123		+15,000
FY 2002 President's Submission	17,233	12,180	31,248

(U) CHANGE SUMMARY EXPLANATION:

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

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(U) OTHER PROGRAM FUNDING SUMMARY: The Navy's 6.1 program contributes to this effort.

(U) NAVY 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.

- (U) PE 0601152N (In-House Laboratory Independent Research)
- (U) PE 0601153N (Defense Research Sciences)
- (U) PE 0204163N (Fleet Communications)
- (U) PE 0602235N (Common Picture Applied Research)
- (U) PE 0602782N (Mine Countermeasures, Mining and Special Warfare Technology)
- (U) PE 0603782N (Mine and Expeditionary Warfare Applied Research)
- (U) PE 0603235N (Common Picture Advanced Technology)
- (U) PE 0206623M (Marine Corps Ground/Supporting Arms Systems)
- (U) PE 0603640M (Marine Corps Advanced Technology Demonstrations)
- (U) PE 0603612M (Marine Corps Mine/Countermeasures Systems)
- (U) PE 0603635M (Marine Crops Ground Combat/Support System)
- (U) PE 0206313M (Marine Air Ground Task Force Command/Control/Communications/Computers & Intelligence)

(U) NON NAVY RELATED RDT&E:

- (U) PE 0603004A (Weapons and Munitions Advanced Technology)
- (U) PE 0603005A (Combat Vehicle and Automotive Advanced Technology)
- (U) PE 0603606A (Landmine Warfare and Barrier Advanced Technology)
- (U) PE 0603607A (Joint Service Small Arms Programs)
- (U) PE 0603619A (Landmine Warfare and Barrier Advanced Demonstrations)
- (U) PE 0603772A (Battlefield Force Integrations)

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- (U) PE 0604710A (Night Vision Systems-Engineering Development)
- (U) PE 0604808A (Landmine Warfare and Barrier Engineering Development)
- (U) PE 0602301E (Computing Systems and Communications Technology)
- (U) PE 0602702E (Tactical Technology) Technology Demonstrations (ATDs)
- (U) PE 0603226E (Experimental Evaluation of Major Innovative Technologies)

(U) SCHEDULE PROFILE: Not applicable.

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