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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)				DATE June 2001	
APPROPRIATION/BUDGET ACTIVITY RDT&E/Defense-Wide/BA 3				R-1 ITEM NOMENCLATURE Joint Warfighting PE 0603727D8Z	
<i>COST (In Millions)</i>	FY 2000	FY 2001	FY 2002	Cost to Complete	Total Cost
Total Program Element (PE) Cost	7.634	7.538	7.613	Continuing	Continuing
Joint Warfighting/P727	7.634	7.538	7.613	Continuing	Continuing

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

(U) **BRIEF DESCRIPTION OF ELEMENT:**

(U) In May 1998 the Secretary of Defense appointed Commander-in-Chief, United States Joint Forces Command (formerly the US Atlantic Command), as the Defense Department's Executive Agent for Joint Experimentation. Subsequently, the Department realigned resources to support the Joint Forces Command's new role. In FY 1999 funds from this Program Element were redirected to support the initial stand-up of Joint Forces Command's Joint Experimentation Directorate. Funding for joint experiments was transferred to Joint Forces Command through the Navy. Funding to support the Joint Advanced Warfighting Program concept development, the digital network infrastructure, and technology feeder support for joint experimentation was retained in this PE. Program Element 0603727N was established to provide Joint Forces Command with their own funding source in FY 2000.

(U) The Joint Warfighting PE supports three related activities: the Joint Advanced Warfighting Program (JAWP), the Information Technology Backplane (ITB), and technology feeder support for joint experimentation. While these activities strongly support Joint Forces Command's joint experimentation efforts, a separate program element has been retained since the activities support other organizations in addition to Joint Forces Command, and they require a degree of independence from Joint Forces Command to function as envisioned.

(U) The JAWP was established by the Office of the Secretary of Defense (OSD), with the support of the Vice Chairman of the Joint Chiefs, to serve as a catalyst for innovation and change. This program's focus is on assisting in the formulation and assessment of advanced concepts and capabilities, plus identifying enabling technologies and integration options for the Department. These concepts drive changes in the doctrine, organization, training and education, materiel, leadership and facilities (DOTMLF) of the Services. The JAWP serves a key role in identifying, exploring and evaluating breakthrough warfighting capabilities. It builds on the lessons learned from earlier Service experiments that have underscored the importance of having a firm conceptual basis upon which to build experiments. The JAWP concentrates on joint, vice Service-unique, revolutionary concepts. In identifying and elaborating innovative joint concepts and capabilities, and associated enabling technologies, the JAWP will not only take into account Service efforts, but those of CINCs and Defense agencies as well. The JAWP promotes integration, conducts experiments and assists in implementation. The JAWP's work complements and supports the activities of Joint Forces Command, the Joint Staff, and the OSD. It provides an independent source for formulating advanced concept candidates for joint experimentation. The JAWP is

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composed of both civilian analysts and technologists. The JAWP Analytical Project Office (JAWP-APO), a jointly manned activity established by the Deputy Secretary of Defense, consists of military personnel from the four Services. The civilians provide a level and quality of expertise not generally available in the Department of Defense. The active duty military members provide a current operational perspective to concepts under investigation and serve as a vital link to ongoing relevant activities in the Services.

(U) The Information Technology Backplane provides an advanced network infrastructure that extends commercial capabilities to provide capabilities needed to meet JV2020 needs. Information Superiority is a key JV2020 building block and the ITB provides the means to experiment with the digital transmission capabilities that will be available in five years. The ITB is not a new physical network. It is a virtual network that capitalizes on existing physical networks such as the Defense Information Systems Network (DISN), the Defense Information Systems Agency (DISA)-Defense Advanced Research Projects Agency (DARPA) Leading Edge Services Network (LESN), the Defense Research and Engineering Network (DREN), and the experimental Advanced Technology Demonstration (ATD) net. The ITB has many users from sites served by existing networks but the funding included in this PE is the incremental funding needed to support joint experimentation. For example, this PE provides the circuit costs to extend the ITB from the experimentation site to the nearest point on the backplane (where no other network exists), and only the “extra” backplane costs generated by the Joint Warfighting Experiments. Since joint experiments are very dependent on advanced distributed simulation, or on limited, live, command post exercises that are being driven by simulations, a robust network is needed to interconnect the various sites. These simulations press the state of the art in networking capability, including that of requiring Type-I encryption for protected communications. The ITB also supports new bandwidth intensive applications such as video teleconferencing and high definition television.

(U) The third effort supported by this PE is technology feeder support for joint experiments. There are many Technology Demonstrations (TDs), Advanced Technology Demonstrations (ATDs), and Advanced Concept Technology Demonstrations (ACTDs) that can provide advanced technologies to support joint experiments. For example, the Joint Staff has prepared 72 desired operational capabilities based on JV2010 concepts and 21st Century Challenges. For each Challenge, the Joint Staff has prepared roadmaps that provide opportunities to assess each Challenge. The roadmap for the battlefield awareness challenge shows 42 ACTDs that have the potential to demonstrate some aspect of a desired operational capability supporting battlefield awareness. This effort provides technology managers the resources to expand the scope of a test or demonstration to collect data for the joint staff or JFCOM, thereby leveraging the OSD and Service ACTD investment. The Technology Feeder Support effort is also being used to initiate a Red Team Pilot Project for Joint Forces Command. This Red Team will participate in Joint Forces Command Concept Development and Experimentation to provide an independent assessment that will ensure that product quality stays high and credible. A source of funding like this, which is separate from other Joint Forces Experimentation funding, will provide the necessary independence.

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(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 2000 Accomplishments:

(U) The Joint Advanced Warfighting Program (JAWP), working for the OSD, the Joint Staff, the Joint Forces Command and their subordinate activities in support of Joint Warfighting Experimentation: (1) identified key elements of a joint experimentation process; (2) developed candidate advanced concepts for joint experimentation including the Rapid Decisive Operations (RDO) concept which serves as the integrator for all JFCOM concepts; (3) developed a near-term Joint Strike Force concept that supports the evolution of the overarching RDO initiative; (4) assisted the Pacific Command (PACOM) in its development of a Joint Mission Force concept; (5) developed, organized and executed a follow-on experiment to Joint Forces Command's FY 1999 attack operations experiment (J9901) that captured experiences and lessons learned from the pursuit of time critical targets in Kosovo; (6) developed prototype experimentation plans; (7) conducted research and seminars to classify works on future operational concepts and future security environments that are relevant to joint experimentation; (8) assisted in the planning, design coordination and execution of Joint Forces Command's Millennium Challenge 00 experiment; (9) developed a framework and initial set of metrics to help gauge progress of warfighting transformation efforts for the Director, Joint Staff; (10) led an effort with the Joint Staff Urban Operations Working Group that looked at ways to improve capabilities to conduct operations in urban environments; (11) supported a Chairman, Joint Chiefs of Staff initiative to describe concepts of operations for future joint forces that elaborate on the objectives of JV2020; and (12) planned for and conducted seminars and workshops with other government organizations to identify complementary and supporting technology programs and activities. (\$4.000 million)

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(U) The base ITB network connectivity was continued to the critical sites of JFCOM, TEC and NRL. Advanced engineering support from NRL was given to maintain the network functionality required by JFCOM experiments (Unified Vision 00 and Attack Ops 00). This included the monitoring and tuning of critical network performance parameters. In the area of network management, work on extending Kerberos authentication into Simple Network Management Protocol Version 3 (SNMPv3) and other protocols continued and were submitted to, and favorably received by, the Internet Engineering Task Force (IETF) as proposed standards. Interoperability with Public Key Infrastructure (PKI) protocols began. The testing of the advanced network features of Release 3 of the KG-75 FASTLANE continued. Issues which were identified were fed back to the vendor who incorporated them into software updates. Initial testing of the interoperable KG-175 TACLANE began. The results of these tests were fed back to NSA and the vendor for incorporation into released products. A Linux-based distributed network monitoring and test tool, ATM Network Test Software (ANTS), was developed for use in both the testing of network devices, as well as the monitoring of live, local and wide-area networks. This tool is now available in the public domain. An H.323 voice application has been extended to directly support native ATM clients with direct Quality-of-Service contracts. This application also interoperates with non-ATM connected clients. Efforts in support of JFCOM continued, focusing on assisting in the development of a local infrastructure to extend the ITB to multiple sites/users within JFCOM. (\$1.400 million)

(U) The technology feeder support effort created an ACTD milestone document to track the status and life cycle phases of each ACTD. It will provide an effective planning tool to crosscheck future joint experimentation against planned ACTDs, event participation and military utility assessments. This effort also facilitated the integration of ten ACTDs into the primary FY 2000 joint experiment, MILLENIUM CHALLENGE 2000. These ACTDs are: Global Hawk, Battlefield Awareness and Data Dissemination (BADD), Extending the Littoral Battlespace (ELB), Integrated Collection Management (ICM), Military Operations in Urban Terrain (MOUT), Rapid Terrain Visualization (RTV), Joint Continuous Strike Environment (JCSE), Theater Precision Strike Operations (TPSO), Theater Air and Missile Defense Interoperability (TAMDI), and HUMINT CI Support Tools (HICIST). This activity also initiated an effort to introduce coalition involvement in joint experimentation. (\$2.234 million)

(U) FY 2001 Plans:

(U) The Joint Advanced Warfighting Program (JAWP) will continue its support of JV2020 implementation and the Joint Experimentation work in the Office of the Secretary of Defense, the Joint Staff, and the Joint Forces Command and subordinate elements. Efforts will include both front-end identification and elaboration of concepts and capabilities, plus support for the conduct of experiments. The JAWP will continue to build on its FY 98 through FY 00 experiences with joint operational concept development and experimentation, focusing on enhancing joint operational-level command and control, enabling rapid expeditionary operations and refining the implementation process for lessons learned from joint experimentation. It will continue to mature and expand on the adaptive command and control

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(C2), plus intelligence, surveillance and reconnaissance (ISR), concepts developed during the Attack Operations experiments. It will leverage the experiences and lessons learned during Joint Forces Command's J9901 and Attack Operations 00 experiments, to include the investigation of innovative command and control applications and expanded, more robust sensor suites. It will continue to develop and refine candidate advanced warfighting concepts and capabilities using wargames, and modeling and simulation. It will identify promising and enabling technologies. It will collect and analyze data to support the formulation of the Department's overall Joint Experimentation efforts. Prior to that, however, it will develop a definition and an operational framework for effects-based operations. FY 01 experimentation will focus on laying the foundation for subsequent experimentation with Joint Forces Command on the Rapid Decisive Operations (RDO) concept in FY 02 through FY 04. The JAWP will continue to evaluate these concepts and systems through simulation, wargaming and analysis. It will conduct vulnerability assessments using "Red Teaming" techniques to identify weaknesses and avoid surprises. It will use the transparent wargaming approach, which it developed to assist in the conduct of the J9901 and other experiments. It will also complete its development of a DoD Roadmap for Urban Operations and continue its participation in the NATO Urban Working Group efforts. The JAWP will begin to identify programs, systems and methods to improve and expedite the process of executing and implementing the recommended changes, which result from the joint experimentation process and the development of new technological capabilities. Included in these latter activities, the JAWP will evaluate the systems and products developed in ACTDs for use in the Department's overall joint experimentation program. The JAWP will also seek and develop partnerships among related clusters of ACTDs, DARPA projects, Service Battle Labs, and JT&E activities to participate in related joint experimentation. (\$4.500 million)

(U) The base ITB support for wide-area network connectivity for joint warfighting experimentation will continue, as will the ongoing task of transitioning emerging technology from advanced research network testbeds. Specifically, Unified Vision 01 will be supported and executed while Millennium Challenge 02 will be designed. Initial implementation of secure (Kerberized) network management protocols (SNMPv3) across selected ITB sites is expected. Development and evaluation of advanced security/information assurance devices and tools, such as ATM and host-based layered firewall technologies, will begin in the lab. Distributed applications, such as collaborative tools, will continue. Efforts in support of JFCOM will continue. Connectivity to key sites (JFCOM, TEC, etc.) will continue with selected circuits upgraded as required. Significant hardware upgrades to end-sites will occur. (\$1.400 million)

(U) Experimentation Feeder Support: JFCOM's Campaign Plan 01 identifies 31 major exercises and experiments in FY 2001. The Deputy Under Secretary of Defense (Advanced Systems and Concepts), in coordination with JFCOM and the Joint Staff, will assist in determining which ACTDs, ATDs, and/or Technology Demonstrations best support JFCOM's experimentation events. This funding will be provided to the selected technology managers to support a joint experiment. Funding will be provided for efforts such as system integration, and logistics and test support. Planning and preparations will continue for incorporation of as many technology demonstrations as possible into the primary FY 2002 joint experiment, MILLENIUM CHALLENGE 2002. This will be initial year of funding the DOD Adaptive Red Team (DART) which will evaluate the major joint experiment of 2001 (Unified Vision 01) and prepare to observe and critique MILLENNIUM CHALLENGE 2002. (\$1.638 million)

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(U) FY 2002 Plans:

(U) The JAWP will continue to build on its FY01 Joint Experimentation efforts, building toward FY 04 completion of the Rapid Decisive Operations (RDO) series of joint experiments. The JAWP will conduct human-in-the-loop simulation experiments of selected aspects of the Rapid Decisive Operations concept, including forcible entry operations, networking of ISR capabilities, and overcoming opponents' protective measures. Opportunities will be identified to leverage and integrate Service and other agency programs. Data collection and independent analysis will be conducted and used to produce reports and papers intended to inform the OSD, Joint Staff and the Joint Forces Command leadership of experimentation results and transformation choices. Vulnerability assessments and "Red Teaming" will be conducted to improve the validity and robustness of experimentation. The JAWP will work on the identification of and opportunities facilitating the early transition of new concepts and technologies into actual operational military capabilities. (\$4.500 million)

(U) The base ITB support for wide-area network connectivity for joint warfighting experimentation will continue, as will the ongoing task of transitioning emerging technology from advanced research network testbeds. Specifically, Millennium Challenge 02 will be supported and executed. Final implementation of secure (Kerberized) network management protocols (SNMPv3) across the major ITB sites is expected. Information assurance and other security technologies will continue to be tested and deployed. Efforts in support of JFCOM will continue. Connectivity to key sites (JFCOM, TEC, etc.) will continue with selected circuits and equipment upgraded as required. (\$1.400 million)

(U) Experimentation Feeder Support for Joint Experimentation will continue. JFCOM's Campaign Plan 01 projects 26 major exercise and experiments which can support technology demonstrations. The primary FY 2002 effort will be MILLENNIUM CHALLENGE 02 and the technology feeder support effort will enable the incorporation of numerous technology demonstrations. Plans for OLYMPIC CHALLENGE 04 will be further defined and work will be begin to align the technologies supporting this major integrating exercise. Integrated concept teams will have had the opportunity to prepare more detailed experimentation and assessment plans. Once the concepts and experimentation plans are more clearly articulated, technologies supporting the experiments will be identified. This funding will leverage ongoing developments to support joint experiments, not to fund the development itself. The DOD Adaptive Red Team (DART) Pilot Project will initially be funded from within this project. Its primary of focus in FY 2002 will be to evaluate MILLENNIUM Challenge 2002. (\$1.7 13 million)

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(U) <u>B. Program Change Summary</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Total Cost</u>
Previous President's Budget Submit	7.675	7.607	7.570	Continuing
Appropriated Value	0.000	0.000	0.000	Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed Undistributed Reduction	-0.041	0.000	0.000	
b. Rescission/Below-threshold Reprogramming, Inflation Adjustment	0.000	-0.069	0.000	
c. Other	0.000	0.000	0.043	
President's Budget Submission	7.634	7.538	7.613	Continuing

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Change Summary Explanation:

- (U) **Funding:** FY 2000 funding changes are due to reprogramming adjustments. FY 2001 reductions reflect Section 8086 adjustments.
- (U) **Schedule:** N/A
- (U) **Technical:** N/A
- (U) C. **Other Program Funding Summary Cost:** N/A
- (U) D. **Acquisition Strategy:** N/A
- (U) E. **Schedule Profile:** N/A

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