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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**

COST (In Thousands)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	19924	20975	21487	21190	14808	21722	20968	Continuing	Continuing
C73 SYNTHETIC THEATER OF WAR	1075	1822	1938	602	321	951	784	Continuing	Continuing
C74 DEVEL SIMULATION TECH	3214	2456	212	329	338	848	910	Continuing	Continuing
C77 INTERACTIVE SIMULATION	1023	2220	0	0	0	2155	2138	Continuing	Continuing
C78 COMPUTER GENERATED FORCES	14612	14477	19337	20259	14149	17768	17136	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program element supports the Army's Advanced Simulation Program to enable operational readiness and support the development of concepts and systems for Objective and Interim Force through the application of new simulation technology and techniques. This engineering development and application of simulation technology will provide the tools to electronically link all subcomponents together in a manner that is transparent to the user. The synthetic environment is used to verify the scenarios, tactics/techniques and procedures, train testers on new hardware/software and conduct trial test runs before costly live field tests. The tools developed are available for reuse by developers and users of simulations throughout the Army. Project C73, Synthetic Theater of War (STOW-A), provides innovative applications of legacy systems (live, virtual and constructive, Command, Control, Communications, Computers and Integration (C4I) Surveillance and Reconnaissance) to meet the urgent requirements of the domains (e.g. training shortfalls) until availability of the next generation systems. STOW-A provides direct support to the Training, Exercises and Military Operations (TEMO) domain and the Advanced Concepts Requirements (ACR) domain. TEMO support derives from the demonstrated, low cost training capabilities that are provided by the toolkit. ACR support derives from the demonstrated capability of the kit to support battle lab and Army Warfighting Experiments (AWE) exercises and the development of Tactics, Techniques and Procedures to support digital operations. Project C74, Developmental Simulation Technology, provides simulator equipment upgrades, network upgrades, software upgrades, and resolves interoperability issues in support of the Army's Core DIS Facilities (CDFs) at Fort Knox, Fort Benning, Fort Rucker and the Operational Support Facility in Orlando, Florida. Project C77, Interactive Simulation, focuses on engineering development of advanced simulation technology and tools to provide a reusable synthetic environment. This program will benefit the Army and DOD by providing standards for interoperability and software. The project also develops and enhances reconfigurable simulators which are used as Advanced Concepts Research Tools (ACRT) that will allow the battlelabs to accomplish their mission in support of the ACR, Research, Development and Acquisition (RDA), and TEMO domains. Project C78 develops and upgrades computer generated forces software systems that support experimentation, concept evaluation, materiel development and training. The One Semi-Automated Forces (OneSAF) program will combine and improve the functionality and behaviors of several current semi-automated forces to provide a single SAF for Army use in simulations.

The FY03, STOW-A, C73 Project line will continue the development of the software to link entity-based simulations and simulators to live tactical command and control systems and incorporate live simulations through the instrumented operating systems at the Combat Training Centers (CTCs). The FY03, Developmental Simulation Technology, C74 Project line provides minimal management of Simulation-to-C4I interoperability (SIMCI) effort between the models and simulations and tactical C4I Systems.

0604760A
Distributive Interactive Simulations (DIS) - Engin

Item No. 106 Page 1 of 13
532

Exhibit R-2
Budget Item Justification

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**

The FY03, Interactive Simulation, C77 Project line supports the development of the Environmental Data Base (EDB) for rapid extraction of terrain and environmental data at the user level. The FY03, Computer Generated Forces, C78 Project line will continue development of the functionality to provide OneSAF with terrain, editing and data collection tools, and infrastructure as well as continue the development of life cycle applications and infrastructure enhancements for OneSAF version 1.0.

This program line supports the Interim, Objective and Legacy to Objective transition paths of the Transformation Campaign Plan (TCP).

B. Program Change Summary	FY 2001	FY 2002	FY 2003
Previous President's Budget (FY2002 PB)	20501	26058	31211
Appropriated Value	20689	21158	0
Adjustments to Appropriated Value	0	0	0
a. Congressional General Reductions	0	-183	0
b. SBIR / STTR	-577	0	0
c. Omnibus or Other Above Threshold Reductions (Inflation)	0	0	0
d. Below Threshold Reprogramming	0	0	0
e. Rescissions	-188	0	0
Adjustments to Budget Years Since FY2002 PB	0	0	-9724
Current Budget Submit (FY 2003 PB)	19924	20975	21487

Funds reduced in FY02 (-4.900M) due to program testing delays.
Funds realigned in FY03 (-$9.724M) to support higher priority Army requirements.

0604760A
Distributive Interactive Simulations (DIS) - Engin

Item No. 106 Page 2 of 13
533

Exhibit R-2
Budget Item Justification

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**	**C73**

COST (In Thousands)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
C73 SYNTHETIC THEATER OF WAR	1075	1822	1938	602	321	951	784	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program supports development and integration activities for the STOW-A Digital Sustainment Training (DST) software baseline that includes integration of fielded simulations and simulators with C4ISR systems. The development and integration to be accomplished will result in the capability to provide a seamless synthetic environment which will support digital training, test and mission rehearsal requirements. Specific efforts will include integration of a ground maneuver simulation into the Fire Support Simulation Tools (FSST) architecture and enhancement of the extant intelligence capability of FSST. Additionally, better representation and fidelity of other battlefield operating systems functionality will be gained. Development focuses on leveraging existing and emerging technology in a manner that produces substantial and continual improvements in combat readiness through the use of full spectrum, high fidelity, distributed simulation capability to support a large scale user-based exercise/experiment for JOINT VENTURE training and analytical needs. The Digital Battlefield Sustainment Trainer (DBST) program is a strategic agility program designed to meet the Operational Needs and other critical initiatives from the field. It will do this through the application of available legacy and emerging technologies. This project develops innovative applications of legacy systems (live, virtual, constructive, C4ISR) to meet urgent needs across the domains (e.g., training shortfalls) until the next-generation systems are available. STOW-ADST (DBST) will contribute to providing the required digital training capability to the field, helping to overcome unique digital training challenges that currently exist in the U.S. Army at the brigade level.

 This project supports the Legacy to Objective transition path of the Transformation Campaign Plan (TCP).

FY 2001 Accomplishments:

- 344   Developed the software to link entity-based simulations and simulators, particularly to support Joint Venture and Division Capstone Exercise.

- 292   Incorporated Warfighter Simulation (WARSIM) software as the primary model and early applications of High Level Architecture (HLA).
- 277   Continued development of improved C4I fidelity.
- 162   Verification and validation of software integration.

Total   1075

0604760A (C73)
SYNTHETIC THEATER OF WAR

Item No. 106 Page 3 of 13
534

Exhibit R-2A
Budget Item Justification

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**	**C73**

FY 2002 Planned Program

- 758   Continue to develop the software to link entity-based simulations and simulators to live tactical command and control systems
- 511   Incorporate live simulations through the instrumented operating systems at the CTCs.
- 394   Continue development and integrations of HLA protocols.
- 159   Verification and validation of software integration.

Total   1822

FY 2003 Planned Program

- 1000   Continue to develop the software required to link entity-based simulations and simulators to live tactical command and control systems in support of periodic releases of Army Battle Command Systems (ABCS) software.
- 721   Support Joint Venture and Joint Contingency Force Simulation - Simulation Integration.
- 217   Verification and validation of software integration.

Total   1938

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**	**C73**

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
OPA3, KA6000, Reconfig Simulators	2309	363	0	0	0	0	0	0	2752
OMA, TBIS, 121014	764	1070	1130	577	668	50	0	0	5108

OPA funds in FY01 supported fielding of hardware/software procured in prior years.

C. Acquisition Strategy: Development is accomplished through delivery orders to competitively selected contractors based on performance specifications via STOC.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Award Engr & Integration Contract	1Q	1Q	1Q				
Annual SW Version Release	3Q	3Q	3Q	3Q	3Q	3Q	3Q
Award Architecture Development/Hardware contract		2Q					

FY01 Milestones Completed.

0604760A (C73)
SYNTHETIC THEATER OF WAR

Item No. 106 Page 5 of 13
536

Exhibit R-2A
Budget Item Justification

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
5 - Engineering and manufacturing development

PE NUMBER AND TITLE
0604760A - Distributive Interactive Simulations (DIS) - Engin

PROJECT
C73

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . CCTT TSIU Interface	C/CPIF	Coleman Research, Huntsville, AL	2073	226	2Q	154	1Q	132	2Q	Continue	Continue	Continue
b . STOW-A/DBST Software Development	Various	Multiple	6081	100	1Q	209	1-3Q	518	1Q	Continue	Continue	Continue
c . Architecture Development	C/CPIF	TBD/STOC Compete	100	129	1Q	388	2Q	474	1Q	Continue	Continue	Continue
Subtotal:			8254	455		751		1124		Continue	Continue	Continue

Remarks: Each award is Delivery Order against CPIF contract.

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Engr & Subject Matter Expertise	Various	Multiple	1324	145	1Q	315	1Q	295	1Q	Continue	Continue	Continue
Subtotal:			1324	145		315		295		Continue	Continue	Continue

0604760A (C73)
SYNTHETIC THEATER OF WAR

Item No. 106 Page 6 of 13
537

Exhibit R-3
Cost Analysis

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**	**C73**

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . DBST Integration, evaluation and test	C/CPFF	Multiple	789	162	4Q	378	1-3Q	0		0	1329	0
Subtotal:			789	162		378		0		0	1329	0

Remarks: Required for evaluation of annual version release.

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Program Management	Various	Multiple	2127	313	1Q	378	1-4Q	519	1Q	Continue	Continue	Continue
Subtotal:			2127	313		378		519		Continue	Continue	Continue
Project Total Cost:			12494	1075		1822		1938		Continue	Continue	Continue

0604760A (C73)
SYNTHETIC THEATER OF WAR

Item No. 106 Page 7 of 13
538

Exhibit R-3
Cost Analysis

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**	**C78**

COST (In Thousands)	FY 2001 Actual	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
C78 COMPUTER GENERATED FORCES	14612	14477	19337	20259	14149	17768	17136	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project develops software systems to realistically represent activities of units and forces in simulation. This representation is used to support concept evaluation, experimentation, materiel acquisition and training communities. Initiatives include the systems engineering and design for improvements to the architecture and interoperability of Army Semi-Automated Forces (SAFs), and the evolution to an Army universal computer generated forces system, OneSAF. This evolutionary approach includes development of OneSAF Testbed (OTB) to iteratively upgrade existing SAF capability, while concurrently developing OneSAF. This will provide the various Army domains with an interim SAF to utilize until development of OneSAF is complete. OneSAF is a next generation SAF that will represent a full range of operations, systems and control processes for support of training research, development and acquisition simulation applications including human-in-the-loop. OneSAF is uniquely postured to support the constructive training challenges presented by transformation. Current initiatives include the Joint Virtual Battlefield (JVB), with OTB at the core, which allows tactics and doctrine development for the Future Combat System (FCS) from concept (today) through fielding (2010 and beyond).

The FY03 program will continue development of the functionality to provide OneSAF with terrain, editing and data collection tools and infrastructure as well as continue the development of life cycle applications and infrastructure enhancements for OneSAF version 1.0.

This project supports the Interim and Objective transition paths of the Transformation Campaign Plan (TCP).

FY 2001 Accomplishments:

- 10991 Executed system requirement decomposition, initial architecture design and developed prototype software functionality to provide the initial architecture services and infrastructure, architecture component (editing and data collection tools) and test synthetic environment for OneSAF Version 1.0.

- 2670 Developed software functionality to provide OneSAF with terrain, editing and data collection tools and infrastructure.

- 951 Verified and validated newly developed and integrated software.

Total 14612

0604760A (C78)
COMPUTER GENERATED FORCES

Item No. 106 Page 8 of 13
539

Exhibit R-2A
Budget Item Justification

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**	**C78**

FY 2002 Planned Program

- 11489   Continue development of functionality to provide architectural services, components, synthetic environment and infrastructure capable of supporting initial model development.
- 2050   Continue development of life cycle applications and infrastructure enhancements for OneSAF Version 1.0.
- 938   Verification & Validation of newly developed and integrated software.

Total 14477

FY 2003 Planned Program

- 12240   Continue development of life cycle applications and infrastructure enhancements for OneSAF IOC Version 1.0.
- 5769   Develop functionality to represent behaviors, physical models, and communication models for OneSAF.
- 1328   Verification and validation of newly developed and integrated software.

Total 19337

0604760A (C78)
COMPUTER GENERATED FORCES

Item No. 106   Page 9 of 13
540

Exhibit R-2A
Budget Item Justification

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

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**	**C78**

B. Other Program Funding Summary	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Compl	Total Cost
OMA, 121014	497	1561	2025	2283	2538	2710	2709	Continuing	Continuing

C. Acquisition Strategy: Development based on performance specifications via multiple Task Orders on competitively selected contracts.

D. Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Release OneSAF Testbed (OTB) Version 1.0	1Q						
Award OneSAF Development Task Orders for individual components to meet block requirement	1Q	1Q	1Q	1Q	1Q	1Q	1Q
OneSAF IOC (Version 1.0)					1Q		

FY01 Milestones Completed.

0604760A (C78)
COMPUTER GENERATED FORCES

Item No. 106 Page 10 of 13
541

Exhibit R-2A
Budget Item Justification

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY
5 - Engineering and manufacturing development

PE NUMBER AND TITLE
0604760A - Distributive Interactive Simulations (DIS) - Engin

PROJECT
C78

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Architecture Dev & System Integration	CPFF	Science Applications International Corp, Orlando, FL	0	6250	2Q	6323	1-2Q	6696	1-2Q	0	19269	19269
b. Integrated Environment Dev	CPFF	Advanced Systems Technology, Inc., Orlando FL	0	2003	2Q	1670	1-2Q	1000	1-2Q	Continue	Continue	Continue
c. Synthetic Environment Dev	CPFF	Science Applications International Corp, Orlando, FL	0	1196	1-2Q	1000	1Q	2120	1Q	Continue	Continue	Continue
d. Knowledge Acquisition/Knowledge Engineering	CPFF	Aegis Technologies Group, Huntsville, AL	0	1156	2Q	869	1-2Q	1000	1Q	0	3025	3025
e. OneSAF System Development	C/CPFF	Various/STOC	758	1248	1-2Q	1150	1-2Q	1050	1-2Q	Continue	Continue	Continue
f. OneSAF Testbed	C/CPAF	Lockheed-Martin Inc., Orlando, FL	7012	0		0		0		0	7012	7012
g. Model Development	C/CPFF	Various/TBD	0	0		0		3649	1-2Q	Continue	Continue	Continue
Subtotal:			7770	11853		11012		15515		Continue	Continue	Continue

Remarks: New Competitive Contract for OneSAF Development. Each award is DO aga inst CPFF contract.

0604760A (C78)
COMPUTER GENERATED FORCES

Item No. 106 Page 11 of 13
542

Exhibit R-3
Cost Analysis

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**	**C78**

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . System Analysis	Various	Multiple	745	470	1Q	609	1Q	610	1Q	Continue	Continue	Continue
b . Domain Analysis	Various	Multiple	0	915	1-3Q	815	1-3Q	815	1-3Q	Continue	Continue	Continue
c . Architecture Engr & Tech Spt	C/CPFF	MITRE FFRDC	706	238	1Q	250	1Q	250	1Q	Continue	Continue	Continue
Subtotal:			1451	1623		1674		1675		Continue	Continue	Continue

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . OTB Verification & Validation	Various	Multiple	478	0		0		0		0	478	478
b . OneSAF integration, evaluation and test	C/CPAF	TBD	0	207	1-2Q	300	1-2Q	385	1-2Q	Continue	Continue	Continue
c . OneSAF Verification, Validation & Accreditation	Various	Multiple	0	166	1-2Q	423	1-2Q	652	1-2Q	Continue	Continue	Continue
Subtotal:			478	373		723		1037		Continue	Continue	Continue

0604760A (C78)
COMPUTER GENERATED FORCES

Item No. 106 Page 12 of 13
543

Exhibit R-3
Cost Analysis

ARMY RDT&E COST ANALYSIS(R-3)

February 2002

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and manufacturing development	**0604760A - Distributive Interactive Simulations (DIS) - Engin**	**C78**

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Program management	Various	Multiple	1022	763	1Q	1068	1Q	1110	1Q	Continue	Continue	Continue
Subtotal:			1022	763		1068		1110		Continue	Continue	Continue
Project Total Cost:			10721	14612		14477		19337		Continue	Continue	Continue

0604760A (C78)
COMPUTER GENERATED FORCES

Item No. 106 Page 13 of 13
544

Exhibit R-3
Cost Analysis