

Simulation & Modeling for Acquisition, Requirements and Training (SMART) Reference Guide

April 2001

Acknowledgement

AMSO wishes to express its appreciation to the many agencies whose information has been incorporated into this reference guide. This guide is designed to provide a quick overview of the SMART concept, as well as a short description of selected modeling and simulation tools and where to get more information on the tools. The rapid expansion of home pages for the various headquarters and support contractors is a clear example of how quickly the Army has progressed in its use and exploitation of the Internet. We have tried to incorporate as many URLs as possible to allow you a digital point of reference. Thanks go to all offices whose information is contained herein.

Disclaimer

This guide is intended as an introduction to the concept of SMART and as a quick reference guide for the most commonly used models and simulations within the Army today.

Legend

At the bottom of each page you see a colored circle (or multiple colored circles). This provides a quick reference as to what domain uses this particular tool. For example, if you see a RED circle, the Training, Exercise and Military Operations (TEMO) domain uses this particular simulation tool in accomplishing its simulation requirements. Additionally, as a cross-reference, on page 12, there is an index of included simulation tools and a color code matrix for each model that coincides with the legend below.



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An Introduction to Models and Simulations

Common Definitions

Model - A physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process.

Ref: Army M&S Master Plan

Three basic classes of models

A **mathematical model** is a series of mathematical equations or relationships that can be discretely solved. This includes M&S techniques of numerical approximation to solve complex mathematical functions for which specific values cannot be derived (e.g. integrals).



A **physical model** is a physical representation of the real world object as it relates to symbolic models in the form of simulators.



A **procedural model** is an expression of dynamic relationships of a situation expressed by mathematical and logical processes. These models are commonly referred to as simulations.



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Common Definitions

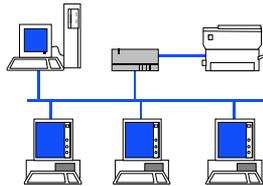
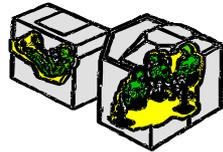
Simulation - A method for implementing a model(s) over time.

Ref: Army M&S Master Plan

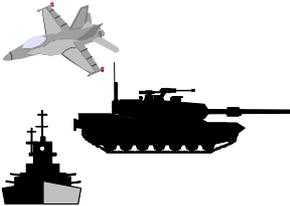
Three Categories

Virtual

Constructive



Live



What is SMART?



The Simulation and Modeling for Acquisition, Requirements and Training (SMART) concept capitalizes on modeling and simulation (M&S) tools and technologies to deal with system development, operational readiness, and life cycle cost. This is accomplished through the collaborative efforts of the requirements, training, operations, and acquisition communities. The Army Acquisition Executive has indicated that the SMART concept is a key mechanism to achieving the Army vision and building the Objective Force.

SMART is a framework to accomplish the vision of using M&S to reduce the cycle time of providing solutions for Army needs, hopefully at cost savings. Key components are the ability to reuse M&S information, exchange data, share standard algorithms, and access other M&S tools in a collaborative environment, across programs and functional areas. This plan identifies the goals, objectives, and enablers necessary to achieve the vision of SMART. The Army recently developed a SMART Execution Plan that identifies necessary actions for each one of the goals. It will take the support of the entire Army community to achieve the vision of SMART. When executed in accordance with the concept articulated below, SMART is expected to yield four significant benefits to the Army that are vital to the Army Transformation

- 1) Reduce time to field new or upgraded systems.
- 2) Increase military worth of fielded systems while simultaneously optimizing force structure, doctrine, tactics, techniques and procedures.
- 3) Concurrent fielding of systems with their training devices.
- 4) Reduce total ownership costs and sustainment burden for fielded systems throughout their service lives;

The SMART Vision Statement:

“Be a world leader in Modeling and Simulation to continuously improve Army effectiveness through a disciplined collaborative environment in partnership with industry, government, and academia.”

The Strategic Goals of SMART:

1. Promote comprehensive modeling and simulation (M&S) policies, disciplined processes, and a high performance workforce to stimulate innovation and agility in developing enhanced Army capability.
2. Establish a means to continuously and quantitatively measure, in a joint environment, life cycle cost and relevant measures of effectiveness.
3. Create and maintain disciplined collaborative M&S environments for all stakeholders to exchange and reuse data and information to support “SMART” modernization decisions.
4. Establish habitual associations and incentives to leverage the investments and inventions of academia, industry, and other government partners so that the Army benefits from the synergy of mutual investments.

How is SMART Significant to You?

Military:

SMART will enhance the Army's ability to transform in the most cost efficient and timely manner. The SMART concept is dependent on functionally diverse communities working together in order to reduce timelines for modernization efforts. The three M&S domains, Advanced Concepts & Requirements (ACR); Research, Development, & Acquisition (RDA), and the Training, Exercises, & Military Operations (TEMO), must work as a team to plan the use of M&S to increase M&S resource sharing and reuse. Increasing the SMART use of M&S will greatly enhance the Army's abilities to rapidly modernize in a time when technologies are changing at a rate that outpaces the traditional doctrinal changes and systems acquisition timelines. The figure below illustrates how mutually supportive the efforts of the three M&S domains are for the Army modernization.



Advanced Concepts & Requirements:



The ACR domain uses M&S to analyze changes in manpower, force structure, logistics, and deployability early in the concept design process. The TEMO, ACR and RDA domain interaction is critical to the development of tactics techniques and procedures (TTPs) and doctrinal changes. Analysis is generally done using constructive simulations but is increasingly used in conjunction with live and virtual simulations. Continuous analysis of issues allows the RDA and TEMO communities to quickly develop or modify their domain specific products and make improvements faster. The spiral feedback mechanism characteristic of a SMART effort increases the Army’s ability to make decisions up front that will ultimately result in cost savings and a better product.

Research, Development, & Acquisition:



Like many manufacturing industries, the RDA community effectively uses virtual prototyping and simulation tools in systems design, development, and acquisition. SMART encourages the additional use of integrated, digital environments that includes all stakeholder participation. An integrated, digital environment empowers the RDA community to work along side the ACR and TEMO domains to produce the best Army systems possible.

Training, Exercises, & Military Operations:



The TEMO domain trains soldiers using a synthetic training environment that includes a mix of live, virtual, and constructive M&S. Meshing the three environments provides soldiers the opportunity to see the analysis conducted by the ACR domain and evaluate the system designs the RDA domain is considering. This allows the TEMO domain to provide input, from a training impact perspective, to the modernization effort. Embracing SMART will produce an enhanced training support system and embedded training system during unit fielding.

Industry:

M&S is being adopted industry wide to generate efficiencies, bring products to the market quicker, and retain market share through increased product quality and service life. The use of M&S is accelerating due to technology advances. Technology is exchanged more freely and at less cost than ever. The Army looks to industry to keep pace with adversaries who are technologically sophisticated. The Army must put the forces of the digital information age to work in achieving its Transformation and to maintain capability overmatch.

Academia:

The Army is keenly interested in partnering with universities and labs in the area of M&S. The SMART vision requires education, cultural awareness and basic research in order to progress. By partnering and leveraging the capabilities of academia, the Army will achieve not only technology benefits, but also the scientists and engineers that will be the future of SMART. Academia plays a key role in the development of future Army leaders.

Where Do I Get More Information?

Organizations:

Army Model and Simulation Office (AMSO)
1111 Jefferson Davis Highway
Suite 503 East
Arlington, VA 22202
<http://www.amsso.army.mil>

Defense Modeling and Simulation Office (DMSO)
1901 N. Beauregard St., Ste 500
Alexandria, VA 22311
Phone: (703) 998-0660
FAX: (703) 998-0667
<http://www.dmsso.mil/>

The Air Force Agency for Modeling and Simulation (AFAMS)
12350 Research Parkway
Orlando, FL 32826-3276
Phone: (407) 208-5700
<http://www.afams.af.mil/>

Naval Air Warfare Center Training System Division (NAWCTSD)
Training Systems Division
12350 Research Parkway
Orlando, FL 32826-3275
<http://www.ntsc.navy.mil/>

Published Articles:

Army Research, Development & Acquisition Magazine
<http://www.sarda.army.mil/DocuCenter/Publications.cfm>

May - June 1999

"Simulations Based Acquisition Is SMART for the Army" (LTG Paul J. Kern and Ellen M. Purdy)

"SBA: The Revolution is Coming" (Dr. Patricia Sanders)

"Comanche: Virtually Revolutionary" (LTC Deborah J. Chase)

"Daimler Chrysler Digital Design"

Arthur Anderson

"AMSAA's SMART Contributions" (LTC Lindell Townsel Jr., Pat O'Neill and Joon Lee)

"SMART T&E The Virtual Proving Ground" (Rick Cozby)

"OASA(ALT) Assessment and Evaluation Office Hosts SMART Conference" (Paul Amos and William Reed)

"SMART and Dual-Use Technology" (Dr. Thomas H. Killion)
"Some Brief Observations on the Future of Army Simulation" (Bran Ferren)

November - December 1998

"Simulation and Modeling for Acquisition, Requirements and Training and Cost as an Independent Variable: A Comparison of Concepts" (Angela D. Winter)

September - October 1998

"Simulation Based Acquisition: Real World Examples" (Sean P. Keller)

July - August 1998

"Simulation Based Acquisition: A Good Thing, But How Do We Get There?" (LTG Paul J. Kern and Ellen Purdy)

"U.S. Army Simulation Based Acquisition Symposium" (Ellen Purdy, Paul Amos, and Sean Keller)

"The Virtual Environment" (Dr. Patricia Sanders)

January - February 1998

"Applying Modeling and Simulation to the Grizzly Program" (LTC Donald Kotchman and Wesley Glasgow)

Other Articles

"Army Acquisition Gets SMART," written by LTG Paul J. Kern and Ellen M. Purdy and published in *Soldier Magazine*. This article can be found at <http://www.dtic.mil/soldiers/sep1999/features/smart1.html>

On the Internet:

❖ *Smart Specific Links:*

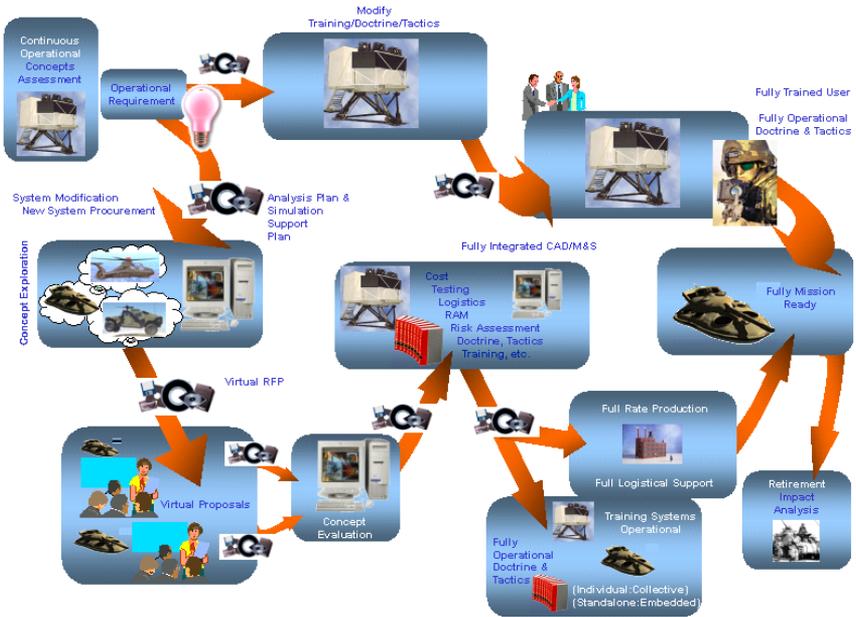
- Army Model and Simulation Office (AMSO) and SMART
<http://www.amso.army.mil/>
- Simulation Based Acquisition (SBA)
<http://sba.iitri.org/>
- Simulation Support Plan (SSP) Guidelines
<http://www.amso.army.mil/smart/ssp-guide.doc>

❖ *General Modeling and Simulation Links:*

- The Air Force Agency for Modeling and Simulations
<http://www.afams.af.mil/>
- The Army Models and Simulations Resources Repository
<http://www.msrr.army.mil/>
- Defense Modeling and Simulation Office (DMSO)
<http://www.dmsomil/>
- Deputy Chief of Staff for Simulations and Analysis (DCSSA)
<http://www-tradoc.monroe.army.mil/dcssa/>
- High Level Architecture

- <http://hla.dmsso.mil/>
- HLA Compliant Models
http://hlatest.msiac.dmsso.mil/compliant_feds.html
- Modeling and Simulation Information Analysis Center (MSAIC)
<http://www.msiac.dmsso.mil/>
- National Simulation Center Homepage (NSC)
<http://www-leav.army.mil/nsc/index.htm>
- Research, Development, and Acquisition for Models and Simulations Domain Management (RDA M&S)
<http://www.sarda.army.mil/zd/rdadomain.htm>
- Training and Doctrine Command
<http://www-tradoc.army.mil/>
- Training, Exercises, & Military Operations (TEMO) Domain Executive Agent
<http://www-leav.army.mil/nsc/index.htm>
- US Army Simulations, Training, and Instrumentation Command (STRICOM)
<http://www.stricom.army.mil/>
- US Army TRADOC Analysis Center (TRAC)
<http://www.trac.army.mil/>
- United States Transportation Command
<http://214.3.17.158/>

Army M&S Vision:



The M&S Vision illustrated above depicts a representation of digital information flow typical of a SMART process. Before any system is ever produced, an idea occurs. With respect to the Army, it is usually something that will allow the Army to accomplish its missions faster and at a reduction in risk and cost (both in lives and in dollars). The SMART environment allows for concept exploration, virtual prototyping and training systems development to occur concurrently. The environment also allows for independent (programmatic) and dependent (Army missions, in a holistic sense) efforts that still provides data exchange, as needed. This integrated exploitation of digital processes allows domains to work together before any hardware is produced. Additionally, when it comes time to retire a system, this M&S vision illustrates the significance of how a SMART process can allow for an impact analyses that will assist in leader timeline decisions across all three Army domains.

Tools Available:

LEGEND ACR RDA TEMO

Tool	Tool Utilization			Acronym	Page
Abrams Full Crew Interactive Simulator Trainer				AFIST	16
Advanced Concept Research Tool				ACRT	17
Advanced Gunnery Training System				AGTS	18
Analysis of Mobility Platform				AMP	19
Army Warfare Simulation / Joint Task Force				AWARS/JTF	20
Automated Cost Estimating Integrated Tools				ACEIT	21
Battle Command Training Program				BCTP	22
Bradley Full Crew Interactive Simulator Trainer				BFIST	See AFIST
Brigade/Battalion Battle Simulation				BBS	23
BTCP Intelligence Collection Model				BICM	24
CH-47 Flight Simulator				CH-47	See CMS
Close Combat Tactical Trainer				CCTT	25
Combat Mission Simulator AH-64				CMS	26
Combat Service Support Theater Sustainment Support				CSSTSS	27
Combined Arms and Support Task Force Model				CASTFOREM	28
Combined Arms Operations at Brigade Level Realistically Achieved Through Simulation				COBRAS	29
Combat XXI				CBTXXI	30
Combined Arms Tactical Trainer				CATT	31
Conduct of Fire Trainer				COFT	32
Corps Battle Simulation				CBS	33
Deployable Exercise System				DEXES	34
Deployable Force-on-Force Instrumented System				DFIRST	35
Deployable Instrumentation Training System				DITS	36

LEGEND					
					
	ACR	RDA	TEMO		
Tool				Acronym	Page
Digital Battlestaff Sustainment Trainer				DBST	37
Eagle				Eagle	38
Fire Simulation				FIRESIM	39
Individual Tactical Environment Management System				ITEMS	40
Integrated Distributed Engineering Evaluation and Analysis Simulation				IDEEAS	41
Integrated Theater Engagement Model				ITEM	42
Janus				Janus	43
Joint Conflict and Training Simulation				JCATS	44
Joint Deployment and Logistics Model				JDLM	45
Joint Flow and Analysis System for Transportation				JFAST	46
Joint Modeling and Simulation System				JMASS	47
Joint Simulation System				JSIMS	48
Joint Theater Logistics System				JTLS	49
Joint Warfare System				JWARS	50
Mobile Automated Instrumentation Suite				MAIS	51
Modular Semi-Automated Forces				ModSAF	52
Multiple Integrated Laser Engagement System 2000				MILES 2000	53
Multiple Integrated Laser Engagement System II				MILES II	54
One Semi-Automated Force				OneSAF	55
Precision Range Integrated Maneuver Exercise				PRIME	56
Simulation in Training for Advanced Readiness				SIMITAR	57
Simulation Network				SIMNET	58

LEGEND					
	 ACR	 RDA	 TEMO		
Tool				Acronym	Page
Spectrum				Spectrum	59
Simulation Testing Operations Rehearsal Model				STORM	60
Tactical Simulation				TACSIM	61
Tactical Warfare Model				TACWAR	62
Tank Weapons Gunnery System/Precision Gunnery System				TWGSS/PGS	63
UH-60 Flight Simulator				UH-60	See CMS
Vector in Command				VIC	64
Warfighter's Simulation				WARSIM	65

Area of Use:

Tool	Acronym	Combined Arms	Combat	Combat Support	Combat Service Support
Abrams Full Crew Interactive Simulator Trainer	AFIST	X	X		
Advanced Concept Research Tool	ACRT	X	X	X	X
Advanced Gunnery Training System	AGTS	X	X		
Analysis of Mobility Platform	AMP	X			
Army Warfare Simulation / Joint Task Force	AWARS/JTF	X	X	X	X
Automated Cost Estimating Integrated Tools	ACEIT	X		X	X
Battle Command Training Program	BCTP	X	X	X	X
Bradley Full Crew Interactive Simulator Trainer	BFIST	X	X		
Brigade/Battalion Battle Simulation	BBS	X	X	X	X
BTCP Intelligence Collection Model	BICM	X	X	X	X
CH-47 Flight Simulator	CH-47	X	X		
Close Combat Tactical Trainer	CCTT	X	X		
Combat Mission Simulator AH-64	CMS	X	X		
Combat Service Support Theater Sustainment Support	CSSTSS	X	X	X	X
Combined Arms and Support Task Force Model	CASTFOREM	X			X
Combined Arms Operations at Brigade Level Realistically Achieved Through Simulation	COBRAS	X	X	X	X
Combat XXI	CBTXXI	X	X	X	X
Combined Arms Tactical Trainer	CATT	X	X	X	
Conduct of Fire Trainer	COFT	X	X		
Corps Battle Simulation	CBS	X	X	X	X
Deployable Exercise System	DEXES	X	X	X	X
Deployable Force-on-Force Instrumented System	DFIRST	X	X	X	X
Deployable Instrumentation Training System	DITS	X	X	X	X
Digital Battlestaff Sustainment Trainer	DBST	X	X	X	X
Eagle	Eagle	X			
Enlisted Loss Inventory Model	ELIM	X	X	X	X
Fire Simulation	FIRESIM	X	X		
Individual Tactical Environment Management System	ITEMS	X	X		
Integrated Distributed Engineering Evaluation and Analysis Simulation	IDEEAS	X	X	X	X
Integrated Theater Engagement Model	ITEM	X		X	X
Janus	Janus	X	X	X	X
Joint Conflict and Training Simulation	JCATS	X	X	X	X
Joint Deployment and Logistics Model	JDLM	X	X	X	X
Joint Flow and Analysis System for Transportation	JFAST	X			X
Joint Modeling and Simulation System	JMASS	X			
Joint Simulation System	JSIMS	X	X	X	X
Joint Theater Logistics System	JTLS	X	X	X	X
Joint Warfare System	JWARS	X			X
Mobile Automated Instrumentation Suite	MAIS	X	X	X	X
Modular Semi-Automatic Forces	ModSAF		X	X	X
Multiple Integrated Laser Engagement System 2000	MILES 2000	X	X	X	X
Multiple Integrated Laser Engagement System II	MILES II	X	X	X	X
One Semi-Automated Force	OneSAF	X	X	X	X
Precision Range Integrated Maneuver Exercise	PRIME	X	X		
Simulation in Training for Advanced Readiness	SIMITAR	X	X	X	X
Simulation Network	SIMNET	X	X		
Spectrum	Spectrum	X	X	X	X
Simulation Testing Operations Rehearsal Model	STORM	X	X	X	X
Tactical Simulation	TACSIM	X	X	X	X
Tactical Warfare Model	TACWAR	X			
Tank Weapons Gunnery System/Precision Gunnery System	TWGSS/PGS	X	X		
UH-60 Flight Simulator	UH-60	X	X		
Vector in Command	VIC	X			
Warfighter's Simulation 2000	WARSIM	X	X	X	X

Full Crew Interactive Simulator Trainer (AFIST Abrams), (BFIST Bradley)



System Description: AFIST/BFIST is a simulator that attaches directly to M1/M1A1/M1IP Abrams Tanks' vision blocks and sights. It manages over 500 tactical engagements derived from FM 17-12-1. AFIST/BFIST requires full crew engagement with the interactive system against a virtual OPFOR and over virtual terrain. AFIST/BFIST includes a computer-generated exercise critique and AAR's after each exercise and uses a scoring system for advancement to further levels of difficulty.

Location: CONUS ARNG

Proponent: STRICOM

Audience: M1 and M2 Crew.

POC: Project Director, AMSTI-PMGCTT, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-5265, fax (407) 384-5180, DSN 970-5265

Internet Site(s): <http://www.stricom.army.mil/PRODUCTS/AFIST/>



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Advanced Concept Research Tool (ACRT)



Ground Vehicle



Soldier System



Aviation

System Description: The ACRT is a family of reconfigurable hardware and software virtual soldier-in-the-loop simulators. Currently, there are three variants: ground vehicle, dismounted infantry, and aviation. The ground and dismounted ACRT variants have two versions; a full up simulator and a desktop simulator. The ACRTs can be networked with other ACRT variants and to ModSAF/OneSAF. The ACRT family provides the Battle Labs an increased capability to perform soldier-in-the-loop experimentation, analysis, requirements determination, concept exploration and doctrine development and “what if” analysis. The ACRT provides the capability to model and analyze from the engineering level to the tactical level. The ACRT will also assist in the ACR Domain’s movement towards the Army’s SMART goals, providing key insights into soldier-machine interfaces.

Location: CONUS TRADOC Battle Labs

Proponent: TRADOC

Audience: Individual, Crew, Platoon, Company, Battalion

POC: TRADOC Manager, M&S, DCSCD, TRADOC, (757) 788-8329; Project Director, AMSTI-PMSTI, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-3663, fax (407) 384-3660, DSN 970-3663

Internet Site(s):



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Advanced Gunnery Training System (AGTS)



System Description: AGTS is a simulator providing training to individual crewmen, crews, sections, and platoons for the M1A1, M1A2, and M2/M3A3. AGTS provides training in precision and degraded gunnery skills. It is a mobile unit with four different vehicle configurations.

Location: Formal settings at Ft. Knox and Ft. Benning; other units Army-wide, including NG and AR.

Proponent: STRICOM

Audience: Crew, Platoon, Company, and Battalion.

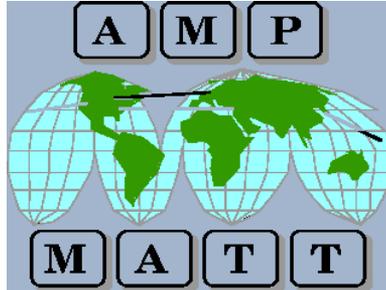
POC: Project Director, AMSTI-PMGCTT, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-5265, fax (407) 384-5180, DSN 970-5265

Internet Site(s):<http://www.stricom.army.mil/PRODUCTS/AGTSM1A2>



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Analysis of Mobility Platform (AMP)



System Description: AMP is a transportation modeling "shell" that integrates models to obtain an end-to-end simulation of the Defense Transportation System. AMP allows users to rapidly set-up, tailor, and extend transportation and logistics models to support programmatic analysis, wargames and exercises, execution, deliberate planning, and costing functions. The current suite of models includes the Model for Intertheater Deployment by Air and Sea (MIDAS), the Enhanced Logistics Intratheater Support Tool (ELIST and CONUS ELIST), and the Joint Flow and Analysis System for Transportation (JFAST).

Location:

Proponent: USTRANSCOM

Audience:

POC: USTRANSCOM TCJ5-SC, 508 Scott Drive, Scott AFB, IL 62225. Telephone is DSN 576-5109 or commercial (618) 256-5109. The Project Manager is within USTRANSCOM TCJ6-GTNP MO, (same street/city address) telephone DSN 576-8017 or commercial (618) 256-8017. The AMP Functional Manager is at DSN 576-5109 or commercial (618) 256-5109.

Internet Site(s): <http://public.transcom.mil/J5/j5s/amp-home.html>
http://public.transcom.mil/J5/amp/AMPIntro/amp_intro.html
<http://www.transchool.eustis.army.mil/DTO/DTO-Chp6.htm>



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Army Warfare Simulation / Joint Task Force
(AWARS/JTF)

System Description: AWARS/JTF is a constructive simulation that is capable of a Corp level exercise with resolution units at either the Company or Battalion level. AWARS/JTF will replace EAGLE and VIC. AWARS/JTF will have the ability to interact with virtual simulations and take part in exercises that use the distributed simulation communication protocols

Location:

Proponent: TRAC

Audience:

POC: Mr. H. Kent Pickett, (913) 684-4595, DSN 552-4595, fax (913)684-9232, pickettk@trac.army.mil. The Project Manager for AWARS can be reached at (913) 684 -9273, DSN 552 - 9273.

Internet Site(s):

http://www.bos.saic.com/Projects/AWARS/intro_AWARS.html



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Automated Cost Estimating Integrated Tools (ACEIT)



System Description: ACEIT is an automated architecture and framework for cost estimating and other analysis tasks using techniques described in the Army manuals (Cost Analysis Manual and Economic Analysis Manual). It helps analysts store, retrieve, and analyze data, build cost models, analyze risk, time phase budgets, and document cost estimates. ACEIT operates with an Automated Cost Database (ACDB) search and retrieval program that allows a cost analyst to find cost, technical, and programmatic data. It also contains powerful database entry and administration tools to enable any site to create its own tailored database without any knowledge of programming, SQL, or DBMS's needed. ACEIT presents an on-screen view of the cost estimate along with reports of input and backup data. These reports may be generated by appropriation, in current or "then year" dollars. Output data may be downloaded to an ASCII file or Excel Spreadsheet for processing in external applications.

Location: US Government Agencies

Proponent: U.S. Army Cost & Economic Analysis Center (CEAC)

Audience:

POC: Director, US Army Cost and Economic Analysis Center, ATTN: SFFM-CA-CR, 5611 Columbia Pike, Falls Church, VA 22041-5050 or call 703 601-4183.

Internet Site(s): <http://www.asafm.army.mil/ceac/ceac.asp>
<http://www.aceit.com/>



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Battle Command Training Program (BCTP)



System Description: BCTP is a program that supports training of Army Corps, Division, and Brigade commanders and their staffs to operate in a joint or combined environment. BCTP consists of a Battle Command Seminar, the Warfighter Exercise (WFX), and Take Home Package. At a WFX, the training unit operates in the field, but can remain at their home station. The simulated OPFOR fights from NSC, Ft. Leavenworth.

Location: NSC, Ft. Leavenworth, KS.

Proponent: National Simulation Center (NSC)

Audience: Division, Corps.

POC: BCTP Office 1-800-205-9385

Internet Site(s): <http://bctp.leavenworth.army.mil/>



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Brigade/Battalion Battle Simulation (BBS)



System Description: BBS is a battle simulation for command post exercises and is targeted at brigade and battalion commanders and staff. It provides a high-stress training environment with real-time, man-in-the-loop, free play input, which responds to commanders' decisions in the field. BBS models from the brigade through the individual level with the maximum number of entities being 1,000. Personnel are accounted for by rank and MOS. Multiple factions, coalitions, and unknown forces are playable. The BBS AAR collects and presents near real-time data from the exercise.

Location: Currently operational at twenty-four CONUS sites, USFK, USARAK, USAREUR, and SETAF.

Proponent: National Simulation Center (NSC)

Audience: Brigade and Battalion Command and Staff.

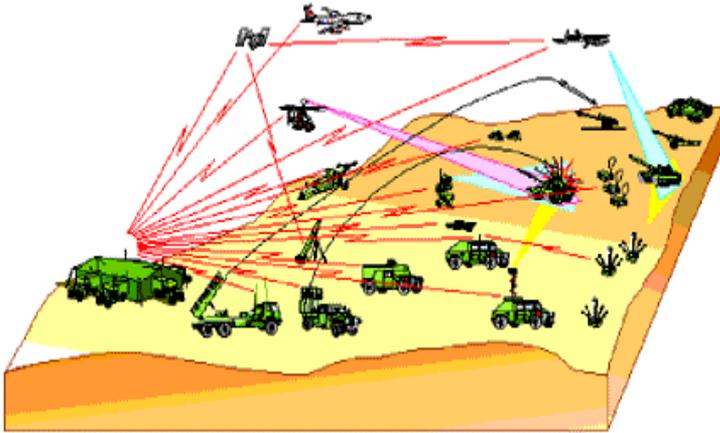
POC: BBS Team Chief – Building 45, 410 Kearny Avenue, Ft. Leavenworth, KS 66027, (913) 684-8418, fax (913) 684-8137

Internet Site(s): <http://www.stricom.army.mil/PRODUCTS/BBS>
<http://www-leav.army.mil/nsc/famsim/bbs/index.htm>



Training, Exercises
& Military
Operations

BCTP Intelligence Collection Model (BICM)



System Description: BICM is a secret collateral-level intelligence collection simulation system for training corps and division intelligence staffs. The system interfaces with CBS. BICM accommodates information recognition requirements, collection activities, and intelligence data integration. BICM realistically limits the kinds, quantity, and accuracy of intelligence information available to the training audience, and provides data based on specific missions. COMINT, ELINT, GSR, HUMINT, and MTI sensors are integrated into the system.

Location: USAREUR; CONUS, Korea.

Proponent: National Simulation Center (NSC)

Audience: Separate Brigade, Division, Corps and Echelons Above Corps

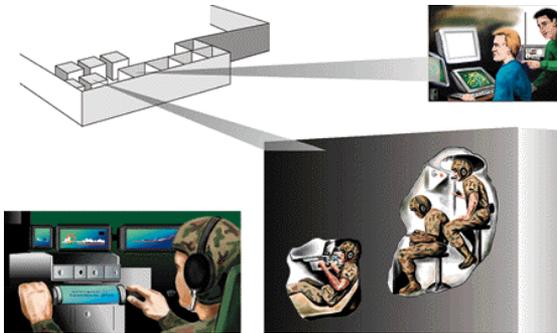
POC: BCTP Office 1-800-205-9385

Internet Site(s): <http://bctp.leavenworth.army.mil>



Training, Exercises
& Military
Operations

Close Combat Tactical Trainer (CCTT)



System Description: CCTT is a component of the Combined Arms Tactical Trainer program. CCTT is a distributed interactive system of simulators for use at platoon level through battalion task force level. It integrates such simulators as the M1A1 and the M2 with the dismounted infantry simulator and the M113A3 simulator, in a realistic battle space environment. CCTT includes a playback capability for AAR's. It is compatible with the Distributed Interactive Simulation architecture. CCT will be HLA compliant in September 2001.

Location: CCTT will be fielded as a Company/Team fixed sites to 11 CONUS and OCONUS division locations. Twenty-one mobile platoon sets will support training selected National Guard units.

Proponent: PM-CATT, National Simulation Center (NSC)

Audience: Platoon, Company, and Battalion

POC: Project Manager, AMSTI-PMCATT, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-3600, fax (407) 384-3611, DSN 970-3600

Internet Site(s):

<http://www.stricom.army.mil/STRICOM/PM-CATT/APM-CCTT/CCTT/>



Training, Exercises
& Military
Operations

AH-64 Combat Mission Simulator (CH-47 Flight Simulator) (CMS)



System Description: The AH-64 Combat Mission Simulator provides transition and refresher training of experienced aviators in nap-of-the-earth (NOE) flight, masking/unmasking, engagement techniques, weapons systems operations, and aircraft survivability equipment (ASE). The system provides realistic mission scenarios in a high threat environment against interactive targets. The simulator includes a two-cockpit system with separate cockpits for pilot and co-pilot, with on-board instructor stations. CMS features special effects like turbulence, landing impact, and hostile weapons hit and near miss to enhance the realism of the training. The CH-47, MH-47E, UH-60, and MH-60K simulators provide similar capabilities in support of aircraft specific Aircrew Training Manual training requirements.

Location: US Army has 10 worldwide; Egypt has 1.

Proponent: USAAVNC, Ft. Rucker, AL.

Audience: AH-64 Crew.

POC: Project Director, AMSTI-PMACTT, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-5152, DSN 970-5152, or Technical POC (650) 604-5836, fax (650) 604-2414

Internet Site(s): <http://www.stricom.army.mil/PRODUCTS/AH64/>



Research,
Development
& Acquisitions



Training, Exercises
& Military
Operations

COMBAT XXI
(CBTXXI)



System Description: COMBAT XXI supports the analytical needs of the Army's Advanced Concepts and Requirements (ACR) Domain. It draws from and aggregates other higher level-level ACR Domain M&S efforts such as MOUT and C4I. It is a closed-form, entity level, HLA-compliant simulation of ground warfare including both Marine Corps and Army organizations, C2, weapons, and tactics, techniques and procedures (TTP). It replaces CASTFOREM, the Army's legacy analytical simulation for Analysis of Alternatives.

Location: To be fielded at various Army analysis locations world-wide

Proponent: TRADOC Analysis Center, Fort Leavenworth, KS

Audience: Advanced Concepts and Requirements M&S Domain

POC: Office of the Deputy Chief of Staff for Operations and Plans, (703) 695-2459, DSN 225-2459.

Internet Site: None



Advanced Concept
Exploration and
Analysis

Combat Service Support Training Simulation System (CSSTSS)



System Description: CSSTSS is a detailed simulation of Army CSS operations. CSSTSS trains commanders and staffs from theater level to battalion level on tactical CSS battle command and staff training tasks. Its functions include supply, maintenance, reception, staging, transportation, liquid logistics, medical, mortuary affairs, personnel, ammunition, and Onward-Movement & Integration. The system can be tailored for specific METL tasks for the commander. Observers/Trainers assist in evaluation and presentation of data for AAR's.

Location: NSC, Ft. Leavenworth, KS

Proponent: National Simulation Center (NSC), USARC

Audience: Battalion and above

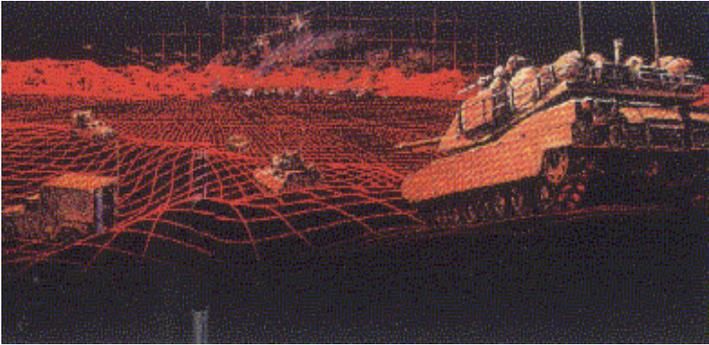
POC: Office of the Director, Logistics Exercise & Simulation Directorate,
(804)765-1789, DSN 539-1789

Internet Site(s): <http://www.leav.army.mil/nsc/famsim/csstss/index.htm>



Training, Exercises
& Military
Operations

Combined Arms and Support Task Force Evaluation Model
(CASTFOREM)



System Description: CASTFOREM is a high-resolution, battlefield, analytical simulation which accurately models: all types of direct fire, engineering operations, combat service support functions, communications, maneuver with capability of dynamic route selection, realistic battlefield obscuration using ARL-BED and COMBIC, and digitized terrain. It is a stochastic, event-sequenced simulation system that models from brigade to individual level in support of Analysis of Alternatives (AoA) studies. It uses either a scenario developed for CASTFOREM or one developed for Janus.

Location: TRAC, White Sands.

Proponent: TRAC

Audience: Brigade and below.

POC: DSN 552-7579, COMM (913) 684-7579

Internet Site(s): None



Advanced Concept
Exploration and
Analysis



Research,
Development
& Acquisitions

Combined Arms Operations at Brigade Level Realistically Achieved Through Simulation (COBRAS)



System Description: COBRAS is structured around a Brigade Staff Exercise which is designed to provide command and control training to selected members of a staff. The scenario of the COBRAS exercise includes movement to contact, area defense, and deliberate attack. Each mission includes three phases, from planning and preparation, through execution, consolidation and reorganization with simultaneous planning for the next mission. COBRAS currently uses BBS for its exercise events. AAR's are key features of the exercise. No dedicated O/C team is required for the system.

Location: Under development, Ft. Knox, KY.

Proponent: A Force XXI initiative by TRADOC

Audience: Battalion and Brigade.

POC: Dr. Kathy Quinkert, DSN: 464-6928

Internet Site(s): <http://www.knox.army.mil/partners/ari/projects/cobras.html>



Training, Exercises
& Military
Operations

Combined Arms Tactical Trainer (CATT)



System Description: CATT links training requirements of multiple functional areas to create a combined arms virtual battlefield. Units can work on their Mission Essential Task List (METL) on the system. The training audience includes crew, company/team, and battalion elements. In the future, CATT could link with WARSIM; aviation, fire support, air defense, and engineer Combined Arms Tactical Trainers will then be a part of CATT.

Location: Army-wide

Proponent: PM-CATT, National Simulation Center (NSC)

Audience: Crew, Platoon, Company, and Battalion.

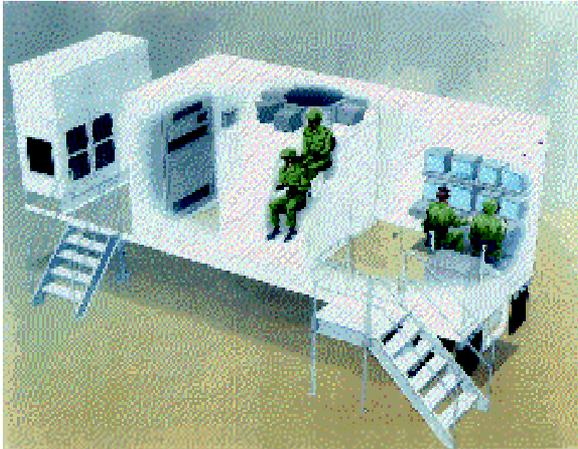
POC: Project Manager, AMSTI-PMCATT, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-3600, fax (407) 384-3611, DSN 970-3600

Internet Site(s): <http://www.stricom.army.mil/STRICOM/PM-CATT/>



Training, Exercises
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Operations

Conduct of Fire Trainer (COFT)



System Description: COFT is a mobile or fixed-site Armor training simulator that pairs the vehicle Commander and Gunner inside the tank simulator in a realistic engagement environment. The simulation varies in target type and number, range, target motion, visibility, and other conditions. The simulator can be used to train an array of tank combat training tasks (IAW FM 17-12-1), and the system can design training programs based upon crew performance. The I/O can choose from four training programs: sustainment, transition, cross, and basic.

Location: CONUS; Korea; USAREUR.

Proponent: PM-TRADE

Audience: M1 and M2 Crew.

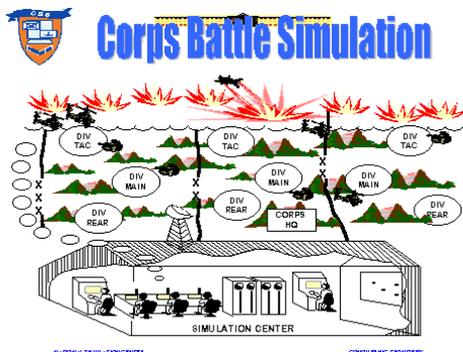
POC: 407-384-3690 DSN: 970-3690

Internet Site(s): <http://www.stricom.army.mil/PRODUCTS/coft/>



Training, Exercises
& Military
Operations

Corps Battle Simulation (CBS)



System Description: CBS supports training exercises that involve Joint, Corps, and Division commanders and staff officers. Functional capabilities include ground combat, Army Aviation, artillery, ground movement, Air Defense Artillery, NBC, logistics, tactical air, engineer, and SOF components. CBS software supports real time interactive processes, graphics, and data communications networking. It is a part of the Joint Training Confederation and interacts with AWSIM, RESA, and MTWS using aggregate level simulation protocol (ALSP).

Location: Currently fielded to all active Army Divisions and Corps along with USACOM.

Proponent: National Simulation Center (NSC)

Audience: Separate Brigade, Division, Corps, and Echelons Above Corps.

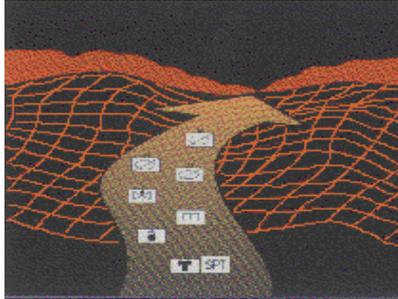
POC: Branch Chief - 410 Kearney Avenue, Building 45, Ft. Leavenworth, KS 66207-1306, (913) 684-8159, DSN 552-8159, fax (913)684-8137

Internet Site(s): <http://www.stricom.army.mil/products/cbs/>
<http://www-leav.army.mil/nsc/famsim/cbs/index.htm>



Training, Exercises
& Military
Operations

Deployable Exercise Support (DEXES)



System Description: DEXES was originally designed by US Southern Command to model a society's response to actions taken in the course of a peace-keeping or humanitarian disaster-relief operation. DEXES contains a dynamic model of social systems under severe stress. This model has several components: refugee movements, epidemics, public opinion, civil unrest, ethnic and political tensions, and economic conditions. The variables in the DEXES model respond (a) to scripted and spontaneous events, (b) to actions taken by the players in the exercise, and (c) to events that are triggered by special conditions. The players in a DEXES exercise include military units, city, regional and national governments, non-governmental organizations, and international organizations such as the UN or NATO. DEXES runs only on Macintosh computers.

Location: USSouthCom, Miami, FL.

Proponent: USSouthCom, SCJ5-PAS, 3511 NM 91st Avenue, Miami, FL 33172

Audience: Brigade, Division, and Corps

POC: Dr. Loren Cobb, 970-963-4717

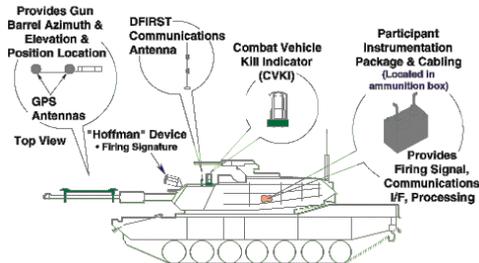
Internet Site(s): <http://www.aetheling.com/models/MOOTW/DEXES.html>



Training, Exercises
& Military
Operations

Deployable Force-on-Force Instrumented System (DFIRST)

DFIRST Instrumentation Package (M1A1)



System Description: DFIRST is a low-cost, high performance training system that uses global positioning system (GPS) satellites, high-speed wireless communications, and digital terrain map displays to sharpen the combat skills of armored units. During battle exercises, combat vehicles are divided into offensive and defensive forces and, instrumented with SRI International's DFIRST equipment, will use "electronic" instead of real bullets to simulate realistic combat skirmishes. During a training engagement, positions for each vehicle and soldier are recorded electronically on DFIRST computers, along with trigger-pulls and simulated vehicle disabling "kills" so the exercise can be replayed to emphasize lessons learned and to refine combat skills. DFIRST instrumentation will also be affixed to operational military equipment such as tanks, infantry fighting vehicles, surface-to-air platforms, and combat support vehicles to monitor their movements and weapon engagements during battlefield training exercises. While the exercise is underway, electronics on board each tank and combat vehicle inform the crew visually via display or audibly via voice cues over the intercom if they suffered damage as a result of the simulation. Additionally, miniaturized packages can be carried by infantry troops to track their status during combat training exercises.

Location: Various Army National Guard locations within CONUS

Proponent: Army Training Support Center, Fort Eustis, VA

Audience: Army National Guard Combat Battalions

POC: STRICOM, Product Manager, (407) 384-5170, DSN 970-5170

Internet Site: None

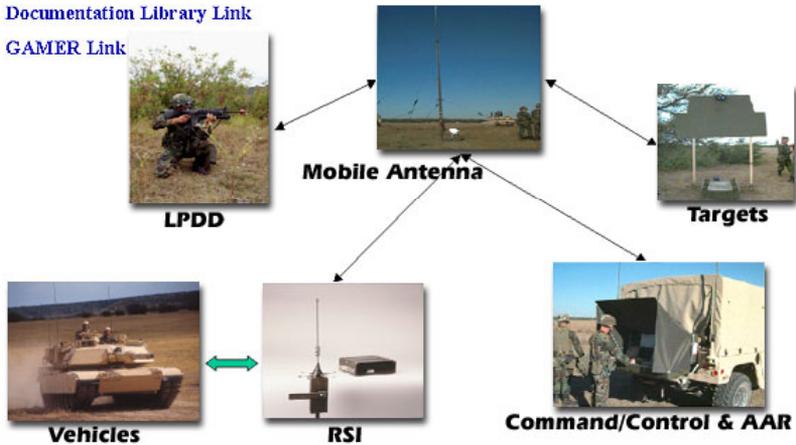


Training, Exercises
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Operations

Deployable Instrumentation Training System (DITS)

[Documentation Library Link](#)

[GAMER Link](#)



System Description: The Deployable Instrumentation Training System (DITS) is the USAREUR 7th ATC's adaptation of the Gunnery And Maneuver Exercise (GAMER) system developed by Saab Training Systems. The DITS provides a highly-mobile instrumented system that provides area weapons effects, command and control, during and after action review. It is capable of connecting vehicle platforms, dismounts, and simulated targets together in a live training environment.

Location: Various Army National Guard locations within CONUS

Proponent: Army Training Support Center, Fort Eustis, VA

Audience: Army National Guard Combat Battalions

POC: STRICOM, Product Manager, Live Training Systems, (407) 384-5170, DSN 970-5170

Internet Site: <http://www.stricom.army.mil/PRODUCTS/DITS/>



Training, Exercises
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Operations

Digital Battlestaff Sustainment Trainer (DBST)



System Description: The Digital Battlestaff Sustainment Trainer (DBST) is a federation of constructive Distributed Interactive Simulations (DIS) and other state-of-the-art-technology that, collectively, simulate military operations. It uses information produced by the simulations to stimulate C4ISR systems in a unit's tactical operations center. DBST facilitates battlestaff collective training by requiring the staff to react to incoming digital information while executing the commander's tactical plan. The targeted training audience is brigade and battalion battle staffs, including functional command post training and full command post training. Battle staffs of higher echelons may also employ DBST to achieve limited training objectives. DBST includes an entity-based ground maneuver model (JANUS 7.06d or JCATS 2.3), a fire support model (FIRESIM XXI) and an air defense model (EADSIM) that provides ground and airborne air defense, tactical ballistic missile defense, ground and airborne target acquisition and intelligence gathering, and fixed and rotary wing aviation models. DBST incorporates an integrated AAR support capability via the use of VISION XXI and the Digital Capture Analysis and Review System (DCARS). DBST also provides the capability to link the virtual, constructive and live domains of training at the Army's Combat Training Centers (CTC's) through the use of software and hardware that allows data to be exchanged between the CTC's Instrumentation System (IS) and the DBST simulated environment.

Location: FORSCOM, USAREUR, TRADOC, Korea

Proponent: National Simulation Center

Audience: Brigade and Battalion Battle Staffs

POC: Email DBST at webmaster@dbst.org

Internet Site(s): <http://www.dbst.org/>



Training, Exercises
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Operations

Eagle



System Description: Eagle is a corps/division level model that simulates the operational level of war and includes joint and combined operations. Eagle supports COA Assessment, Combat Development, Decision Support, Exercise Driving, Force Capability, Force Composition, Force Requirements, Mix Assessments, Scenario Generation, and Staff Training. The system can model ground combat, FS, ADA, engineering and mine support, Army Aviation, Air Force Aviation, C2, Intelligence and Electronic Warfare, and Commo. Eagle is a multi-sided simulation and can model down to company level. It includes a graphical portrayal of the battlefield.

Location: CAA, TRAC.

Proponent: TRADOC Analysis Center - Fort Leavenworth (TRAC-FLVN)

Audience: Division, Corps, and EAC.

POC: (913) 684-4595, DSN 552-4595, fax (913)684-9232,

Internet Site(s): None available.

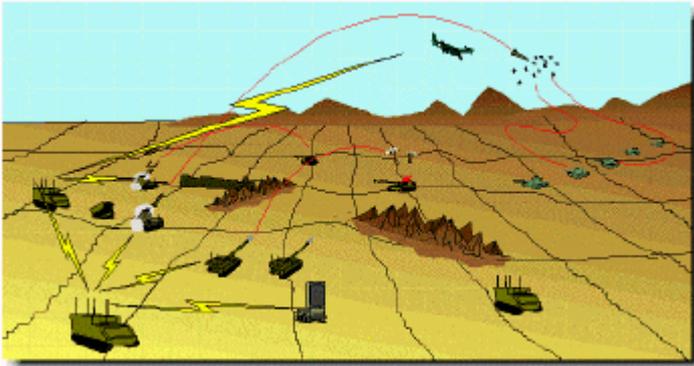


Advanced Concept
Exploration and
Analysis



Training, Exercises
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Operations

Fire Simulation (formerly known as TAFSM) (FIRESIM)



System Description: FIRESIM is an event-sequenced, stochastic simulation of opposing artillery forces. FIRESIM may be executed in either distributed or closed analytical mode and is played at the division level. It is an analysis/evaluation tool designed primarily to analyze the relative differences between competing artillery systems (target acquisition sensors, automated command and control systems, ammunition, and delivery platforms). Units in FIRESIM move as platoons or as individual weapon systems. Artillery force structure and support relationships are explicitly modeled. Once the simulation begins, there is no man-in-the-loop interaction. FIRESIM is fed by VIC scenario output; System inputs include weapon and sensor characteristics, ammunition characteristics, and red/blue system lethal areas. Inputs provided by AMSAA and TRAC.

Location: TRAC(WSMR)

Proponent: D&SA Battle Lab, Ft. Sill, OK.

Audience: Division.

POC: Field Artillery School (D&SA Battle Lab, (580) 442-3832)

Internet Site(s): None available.



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Analysis

Interactive Tactical Environment Management System (ITEMS)



System Description: ITEMS is an off the shelf integrated software system that configures and runs a synthetic tactical environment, including programmable interactive players and support for command and control authority structures. The user can generate a target rich tactical scenario without hardcoded data limitations. The user creates all elements within the scenario. Scenarios created within the framework of ITEMS can range from simple engagements to complex interactive warfighting simulations. The system includes 2-D terrain maps and 3-D views.

Location: CSRDF, MESEF, ARDEC, TACOM, USARI, SAVVIE, AATD, TRAC, AWC, CECOM-ISP, NAWCSTD, NCCOSD, SAIC, SIKORSKY, BOEING, TSMO, MICOM, International

Proponent: Aviation RDEC

Audience: RDA.

POC: *Within CAE Electronics LTD:* Marketing Manager of the Military Simulation & Training Department at CAE Electronics Ltd. 8585 Cote de Liesse CP 1800, Saint-Laurent, Quebec H4L 4X4 (514) 734-5700, fax (514) 734-5718, items@cae.cac

Within the Army: Chief of Crew Station R&D Branch in the Aeroflight dynamics Directorate Department of US Army Aviation and Missile Command, MS 243-4, Ames Research Center, Moffett Field, CA 94035, (650) 604-5161, fax (650) 604-6475,

Internet Site(s): <http://www.cae.ca/software/items/index.shtml>



Advanced Concept
Exploration and
Analysis



Research,
Development
& Acquisitions



Training, Exercises
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Operations

Interactive Distributed Engineering Evaluation and Analysis Simulation
(IDEEAS)



System Description: IDEEAS makes BEWSS an interactive tool for "what if" analysis. It assesses weapon system effectiveness; simulates an environmentally degraded battlefield; provides a high-fidelity, flexible, and rapidly-reconfigurable simulation test environment; executes in real-time, faster than real-time, or slower than real-time; and interfaces with virtual, live, and other constructive simulations. It is intended to help evaluate overall weapon system performance, perform weapon systems mix analysis, study effects of navigation error, study effects of communication timelines, and compare candidate replacement system performance against current fielded system.

Location:

Proponent: Missile Research & Development Engineering Center

Audience:

POC: Commander, US Army Aviation and Missile Command, Aviation Research, Development, and Engineering Center, Systems Simulation & Development Directorate, ATTN: AMSAM-RD-SS-AA, Redstone Arsenal, AL 35898-5000. (205) 876-7504, DSN 746-2961, FAX: (256) 876-0332,

Internet Site(s): None Available.



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Analysis



Research,
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Integrated Theater Engagement Model (ITEM)



System Description: ITEM is a highly visualized, interactive warfighting simulation which provides integrated air, land, and naval warfare engagement modules for the analysis of joint force operations in theater level campaigns. The simulation is primarily operational and strategic, but tactical level decision making is required to run the system. The model features highly detailed naval forces, average detail for air forces, and very little structure for ground forces. ITEM is a menu-driven and object-oriented event-stepped model. Future developments of the program include a Reconnaissance, Surveillance & Intelligence (RSI) application and a War Game version of the system.

Location: ODP&E, JS, N81, USACOM, CENTCOM, EUCOM, ROK/USCFC, USNWC, IDA, SHAPE Tech Center.

Proponent: USAWC, Defense Special Weapons Agency

Audience: ACR.

POC: At USAWC (717) 245-4768, DSN 242-4768,

Internet Site(s):

<http://carlisle-www.army.mil/usacsl/divisions/std/branches/org/item.htm>



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JANUS



System Description: JANUS is an interactive, multi-sided, closed, stochastic, ground combat simulation featuring precise high-resolution graphics. The simulation provides sufficient resolution to model individual fighting systems for soldiers and can realistically model up to brigade-size maneuver forces. The interactive mode of operation allows commanders and staffs to exercise the decision-making process and practice Battlefield Operating System (BOS) synchronization.

Location: All CONUS Army units, Korea, and TRADOC schools. Several Allied nations for analysis and training. Level of use varies by country.

Proponent: National Simulation Center (NSC), TRAC, and WSMR

Audience: Company, Battalion, and Brigade.

POC: National Simulation Center, ATZL-NSC-S, Bldg 45, 410 Kearny Ave., Fort Leavenworth, Kansas 66027-1325, (913) 684-8327
DSN 552-8327

AMSTI-OPS-C, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, 407-384-3722 Fax: 407-384-3777/DSN 970-3777

Internet Site(s): <http://www-leav.army.mil/nsc/famsim/janus/index.htm>
<http://www.stricom.army.mil/PRODUCTS/JANUS/>



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Analysis

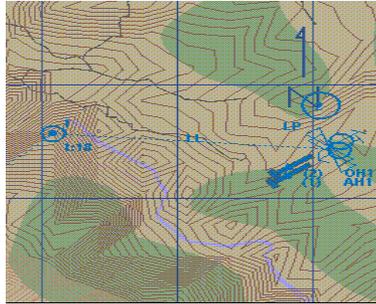


Research,
Development
& Acquisitions



Training, Exercises
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Operations

Joint Conflict and Tactical Simulation (JCATS)



System Description: JCATS is a multi-sided, interactive, entity level, joint conflict simulation. JCATS supports exercises at the Joint Task Force level across the spectrum of war, to include littoral naval operations, ground combat, associated air operations, amphibious operations, OOTW and specialized operations. It is capable of modeling small group, rural, urban, and day/night operations with very high resolution. Several AAR methods are available within the system.

Location: Army: Currently undergoing Alpha Version testing by JWFC. Proposed distribution; CONUS, USAREUR, SOCOM, USMA; Navy: PACOM; Air Force: AFSPA; USMC: Quantico; DOE; DOT.

Proponent: JWFC

Audience: Platoon through Corps; JTF.

POC: JCATS Program Manager (757) 686-7647

Internet Site(s): <http://www.jwfc.js.mil/DODNATO/JW500/JCATS>
<http://www.llnl.gov/nai/group/JCATSHome.htm>



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Training, Exercises
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Operations

Joint Deployment and Logistics Model (JDLM)

System Description: JDLM is the replacement for the Theater Transition and Sustainment Model (TTSM). JDLM is currently a 'bare-bones' model capable of providing training to units conducting deployment training in an Army, Joint, or combined environment. The basic model consists of transportation, logistics and personnel modules. In addition to its intended use as a logistics exercise driver, JDLM demonstrates a potential for use as a Strategic C2 Situation Map.

Location:

Proponent: 7th Army Training Command

Audience:

POC: TRADOC-DCST-NSC-LESD at DSN 539-2219 or Deputy Director, Logistics Exercise and Simulation Directorate (LESD), Bldg. 1109, Battle Support Center National Simulation Center, Fort Lee, VA 23801 (DSN 539-1788/1789 or commercial (804) 765-1788/1789. Fax 539-1648, (804) 765-1648)

Internet Site(s): <http://www.amso.army.mil/sim-sys/jdlm.htm>



Advanced Concept
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Research,
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Joint Flow and Analysis System for Transportation (JFAST)



System Description: JFAST is a high speed analytical tool used for making detailed estimates of the resources required to transport military forces (including cargo, personnel, and their sustainment) during various scenarios. An OPLAN or exercise TPFDD may identify where and when the military forces are to be deployed.

Location:

Proponent: TRANSCOM

Audience:

POC: Technical assistance is available from TCJ3/J4-OPJ, (618) 256-6898 (DSN 576). POC at USAWC

Internet Site(s):

<http://carlisle-www.army.mil/usacsl/divisions/std/branches/org/jfast.htm>

<http://public.transcom.mil/J5/amp/AMPChapter7/7.2.html>



Advanced Concept
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Joint Modeling and Simulation System
(JMASS)



System Description: JMASS is a simulation support environment. It is a collection of well-defined, well-documented interface standards to which a model should be built. It also includes a tool kit which allows modelers to build representations of real world systems, configure those models, assemble them into simulations, execute those simulations, and process the results. The completed model or simulation can be stored in a local model library, and ultimately JMASS will have a link to the DMSO model and simulation resource repository. What distinguishes JMASS from other systems is the fact that the yield is common, reusable, and interoperable. It supports JSIMS and JWARS.

Location:

Proponent:

Audience:

POC: JMASS Program Office (ASC/SMJ), Program Manager, Bldg. 28, 2145 Monahan Way, Wright-Patterson Air Force Base, (937) 255-3969, FAX (937) 255-3682,

Internet Site(s): <http://www.jmass.wpafb.af.mil/>
<http://www.afams.af.mil/programs/projects/jmass.htm>



Research,
Development
& Acquisitions

Joint Simulation System (JSIMS)



System Description: JSIMS is a distributed simulation system which will support Unified/specified commands, component commands, and Joint Task Force training in all military operations, to include mobilization, deployment, sustainment, redeployment, and Operations Other Than War. The distribution of JSIMS will allow joint exercise planners to compose operations from their home stations. High Level Architecture will allow each branch's units to participate in the exercise from their home stations, and to do so consistently within the overall operation. The system includes an AAR capability.

Location: TBD

Proponent: JWFC

Audience: Battalion through Corps and Echelons Above Corps; Joint Task Force.

POC:

Internet Site(s): <http://www.jsims.mil/>



Research,
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Training, Exercises
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Joint Theater Level Simulation (JTLS)



System Description: JTLS is a multi-sided, interactive wargaming system that models a joint and coalition force warfare environment at theater level. JTLS models air, ground, and naval combat, with logistical, Special Operations Forces, and intelligence support. It originally was intended for use in development and analysis of joint and coalition operation plans, but is frequently used as a training model. It is theater-independent and requires no knowledge of programming. The system operates on a single computer or on multiple computers, either at a single site or at distributed sites.

Location: CONUS

Proponent: JWC

Audience: Theater

POC: JTLS Program Manager, JFCOM Joint Warfighting Center, Suffolk VA 23435-2697, (757) 686-7649, DSN 668-7640

Internet Site(s): <http://www.disa.mil/D8/jtls/jtls.html>



Advanced Concept
Exploration and
Analysis

Joint Warfare System (JWARS)



System Description: JWARS will be a state-of-the-art closed-form, constructive simulation of multi-sided joint warfare for analysis. The model will be primarily event-stepped but with some time-stepped interactions or triggers. Its main purposes are to support force structure analysis; perform system (program) trade-off analysis; and perform warfighting course of action analysis. Other applications of JWARS may include determination of requirements for new war fighting capabilities; analysis of weapon system alternatives; and analysis of alternatives for program and budget reviews. Joint warfare mission area representations will include C4ISR; all BOS's; land, sea, and air operations; Special Operations; OOTW; and information warfare. JWARS will conform to High Level Architecture. It will not be interactive, support real-time mission execution, or be linked to real world C4ISR systems.

Location: Limited operational capability will be available in 2001 for familiarization and beta testing. The newest version (1.3) will be provided to the JWARS study team in May 2001. Additionally, 12 test sites will get Version 1.3 in the Fall 2001. Five of the twelve test sites will be CENTCOM, SOCOM, TRANSCOM, ACOM, KOREA, and TRAC-Leavenworth

Proponent: J8, OSD PA&E

Audience: Theater.

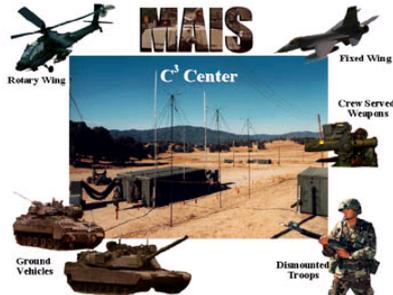
POC: The Army Representative can be reached at the JWARS office Suite 620, 1555 Wilson Boulevard, Arlington, VA 22209. (703) 696-9490, DSN 426-9490, Unclassified FAX: (703) 696-9563, DSN 426-9563. The JWARS Help Desk can be reached by telephone at (913) 684-9236 or DSN 552-9236; and by e-mail at helpdesk@jointmodels.mil

Internet Site(s): <https://www.jointmodels.mil/>



Advanced Concept
Exploration and
Analysis

Mobile Automated Instrumentation Suite (MAIS)



System Description: The Mobile Automated Instrumentation Suite (MAIS) supports operational and force development testing of current and future weapon systems. Comprised of a mobile Command, Control, and Communications Center (C3 Center) and five categories of Player Units (PU) as shown above, MAIS is capable of supporting combined arms testing or training exercises of up to 1830 participants in real-time. MAIS will support tests required to conduct realistic force development in a combined arms environment. The instrumentation suite is capable of data collection, test/exercise control, and combat simulation for RTCA during force-on-force engagements. MAIS represents the U.S. Army's core operational test instrumentation system with system upgrades planned through 2016 to accommodate new weapon systems, interaction with virtual and constructive simulations, and complete monitoring and analysis of C3 in support of Army Transformation and future U.S. Army initiatives.

Location:

Proponent: STRICOM

Audience:

POC: Project Director MAIS, 407-384-5232 DSN: 970-5232

Internet Site(s):

<http://www.stricom.army.mil/PRODUCTS/MAIS/home.html>



Advanced Concept
Exploration and
Analysis

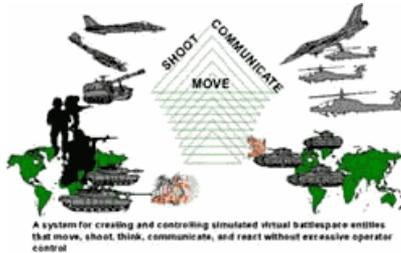


Research,
Development
& Acquisitions



Training, Exercises
& Military
Operations

Modular Semi-Automated Forces (ModSAF)



System Description: ModSAF is an interactive, high resolution, entity level simulation that represents combined arms tactical operations up to the battalion level. It provides a credible representation of the battlefield, including physical, behavioral and environmental models while modeling all seven Battle Operating Systems. ModSAF allows a single operator to control computer-generated forces on a virtual battlefield in a distributed simulation environment to meet the needs of the ACR, RDA and TEMO domains.

Location:

Proponent: STRICOM

Audience: Battalion and below.

POC: Project Director of ModSAF, (407) 384-3862, DSN 970-3862, Lead Engineer (407) 384-3821, DSN 970-3821. For more information on obtaining ModSAF, contact DMSTTIAC by telephone at (407) 249-4712, or <http://dmsttiac.sc.ist.ucf.edu/products/catalog/dev2002/>

Internet Site(s): <http://www.modsaf.org/publicmodsaf1.html>
<http://www.stricom.army.mil/STRICOM/E-DIR/ES/MODSAF/>



Advanced Concept
Exploration and
Analysis



Research,
Development
& Acquisitions



Training, Exercises
& Military
Operations

Multiple Integrated Laser Engagement System (MILES 2000)



System Description: MILES 2000 is a laser transmitter system that attaches directly to individual and vehicle weapon systems. The system components are lightweight and durable, and enable prolonged use during live Force on Force training. The MILES 2000 system replicates the ranges and lethality of each weapon system by use of a laser “bullet”, and also is capable of recording “near misses”. MILES 2000 includes an AAR capability and can be interfaced with Combat Training Center Instrumentation Systems, including SAWE/MILES II. MILES 2000 is a Product Improvement Program to the current Miles program. The Air Ground Engagement System II (AGES II) is the equivalent system for helicopter systems.

Location: TBD

Proponent: PM-TRADE

Audience: Squad, Platoon, Company, Battalion, and Brigade

POC: Project Director, AMSTI-PMLTS, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-5196, fax (407) 384-5185, DSN 970-5196

Internet Site(s): <http://www.stricom.army.mil/PRODUCTS/MILES/>



Training, Exercises
& Military
Operations

Multiple Integrated Laser Engagement System (MILES II)



System Description: The Simulated Area Weapons Effects-Radio Frequency/Multiple Integrated Laser Engagement System (SAWE/MILES II) provides a means to simulate in real time the effects of direct fire, indirect fire (artillery, mortars, persistent and non-persistent chemicals), mines and tactical nuclear weapons. This system uses laser “bullets” to accurately replicate the effects of direct fire. It uses a radio field to replicate indirect fire and attaches directly to weapon systems. The system is deployed to support force-on-force training, and is integrated with the existing CTC instrumentation system.

Location: Army-wide.

Proponent: PM-TRADE

Audience: Squad, Platoon, Company, Battalion, and Brigade.

POC: Project Director, AMSTI-PMLTS, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-5281, DSN 970-5281

Internet Site(s): <http://www.stricom.army.mil/PRODUCTS/SAWE/>



Training, Exercises
& Military
Operations

One Semi-Automated Force (OneSAF)



System Description: OneSAF will be a composable, next generation Computer Generated Forces (CGF) system that can represent a full range of operations, systems, and control processes from the individual combatant and platform to brigade-level operations. It will accurately and effectively represent specific activities of ground warfare (engagement and maneuver), Command, Control, Communications, Computers, and Intelligence (C4I), combat support, and combat service support. It will also employ appropriate representations of the physical environment and its effect on simulated activities and behaviors.

Location:

Proponent: TRADOC Project Office for OneSAF

Audience: Brigade and below.

POC: Product Manager (407) 208-5108 , DSN 970- 5108, or Project Director, OneSAF, (407) 208-3622 , DSN 970-3622

Internet Site(s): www.onesaf.org



Advanced Concept
Exploration and
Analysis



Research,
Development
& Acquisitions



Training, Exercises
& Military
Operations

Precision Range Integrated Maneuver Exercise (PRIME)



System Description: PRIME is a fully transportable MILES-based instrumentation system for an existing range. It provides the capability to train platoon through Task Force-level mechanized, armor and combined arms units in maneuver, target identification and acquisition, gunnery and Force-on-Force engagements. Objective after action reviews are facilitated with near real-time casualty assessment and event collection, a geographical graphics display showing the units as they maneuver through the playing areas, and thru-the-site video (TSV) recording. PRIME is capable of simulating weapons system functionality on Army tactical platforms, to include Dismounted Infantry, ground tracked and wheeled vehicles, aircraft, and crew-served weapons. Area weapons effects can be simulated to support training indirect fire events of chemical and nuclear weapons, artillery, mine fields, and other indirect fire missions through the Global Positioning System position-location data reported by each player unit.

Location: Fielded to the III Corps and Ft. Hood, TX.

Proponent: PM-TRADE; AMSTI-LR

Audience: Squad, Platoon, Company, and Battalion

POC: Peter Smith, NAWC-TSD, Code 242

Internet Site(s):

<http://www.stricom.army.mil/STRICOM/DRSTRICOM/SOFTWARE/SUMMARIES/sw-summ2.html>



Training, Exercises
& Military
Operations

Simulation in Training for Advanced Readiness
(SIMITAR)



System Description: SIMITAR is a program that provides high quality training devices to two test brigades of the Army National Guard. The system allows the NG units to train at their home stations, reducing the number of deployments to training centers and preparing them for better missions once at the training centers. SIMITAR allows training in the following BOS's and their respective Critical Combat Functions: Intelligence, C2, Fire Support, Air Defense, Mobility/Survivability, and CSS. The system incorporates such simulators as A-FIST, SIMNET, and BSTS.

Location: National Guard - The 116th Cavalry Brigade (Idaho) and the 48th Infantry Brigade (Georgia).

Proponent: NGB

Audience: Company, Battalion, and Brigade.

POC: DARPA/SIMITAR: (913) 684-1864 DSN 552-1864
National Guard Bureau: (703) 607-9318 DSN 327-9318

Internet Site(s): None available.



Training, Exercises
& Military
Operations

Simulation Network (SIMNET)



System Description: SIMNET is a system consisting of multiple combat vehicle simulators supporting armor, cavalry, and mechanized units from platoon through battalion task force level for combined arms maneuver training. One or more simulated combat vehicles (typically M1 tanks or M2/3 fighting vehicles) maneuver, shoot, and communicate within a network of stand-alone computers, which simulate terrain and friendly forces. A SAF component is used to simulate the OPFOR and other combat vehicles. SIMNET replicates direct fire, indirect fire, close air support, dismounted infantry, air defense, command and control, and mounted maneuver.

Location: CONUS, Korea, and USAREUR.

Proponent: SIMNET Logistics Directorate

Audience: Crew, Company, and Battalion.

POC: Product Manager, Simulation Technology Integration, (407) 384-3663
Fax: 407-384-3660 DSN: 970-3663
Project Engineer, (407) 384-3858 Fax: 384-3830

Internet Site(s):

<http://www.stricom.army.mil/STRICOM/DRSTRICOM/SOFTWARE/SUMMARIES/simtem.html>



Research,
Development
& Acquisitions



Training, Exercises
& Military
Operations

Spectrum



System Description: Spectrum is an Operations Other Than War (OOTW) simulation. Spectrum simulates political, economic, and socio-cultural activities in combination with movement over digital terrain, logistical problems, and combat operations. Spectrum supports training in peacekeeping, nation assistance, peace enforcement, and humanitarian relief operations. It can exercise on levels from Joint Staff, NATIONAL SIMULATION CENTER (NSC), and State Department, to below brigade level. One unique component of Spectrum is the Regional Assessment Model (RAM) that tracks civilian populace attitudes and the results of “people” programs on that populace. The RAM is available on the Time-step model.

Location: 2 USAREUR sites; 20 CONUS sites; 1 Canada site.

Proponent: National Simulation Center (NSC)

Audience: Brigade, Division, Corps, and Echelons Above Corps.

POC: Email Issues to Spectrum@Leavenworth.army.mil

Internet Site(s):<http://www-leav.army.mil/nsc/famsim/spectrum/index.htm>



Training, Exercises
& Military
Operations

Simulation Testing Operations Rehearsal Model (STORM)

System Description: STORM will provide a distributed simulated battlefield environment to prepare for and conduct brigade and below (B2) C4I and Tactical Internet operational testing. The simulated environment will range from dismounted soldiers and individual vehicles through theater and national C4I systems/assets. STORM will provide scenario generation, database population, C4I stimulation, and test visualization capabilities. Hardware/software interfaces will link the Force XXI Battle Command Brigade and Below systems, via tactical communication models, with B2 entity-based legacy or future simulations. STORM will reuse currently existing models, simulations, and test support tools to the maximum extent possible. Its components are fully transportable or can be replicated at other desired test locations, provided appropriate hardware, space, and power is available.

Location: Operational Test Command, Fort Hood, Texas

Proponent: Army Test and Evaluation Command (ATEC)

Audience: Brigade and Below.

POC: Modeling and Simulation Division (254) 288-1483

Internet Site(s): <http://www.acq.osd.mil/te/programs/cteip/rep.html>



Advanced Concept
Exploration and
Analysis

Tactical Simulation (TACSIM)



System Description: TACSIM supports intelligence training from MI Battalion through Echelons Above Corps. TACSIM primarily provides training for intelligence staffs, collection managers, and analysts through simulations of all aspects of intelligence operations but is also used to support development and testing of Intelligence Electronic Warfare (IEW) systems. TACSIM simulates intelligence collection via COMINT, ELINT, and IMINT sensors, and has a generic HUMINT capability. The system can be linked to other services' models via ALSP. It requires operators with SCI security clearance.

Location: CONUS, USAREUR.

Proponent: National Simulation Center (NSC)

Audience: MI Battalion, Sep Brigade, Division, Corps, and Echelons Above Corps.

POC: Project Director, AMSTI-PMWARSIM, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-5146 DSN: 970-5146

Internet Site(s): <http://www.stricom.army.mil/PRODUCTS/TACSIM/>
<http://www-leav.army.mil/nsc/famsim/tacsim/index.htm>



Training, Exercises
& Military
Operations

Tactical Warfare Model (TACWAR)



System Description: TACWAR is a theater-level joint combat simulation that examines the interaction of strategic and tactical forces in a conventional and chemical environment. TACWAR models forces involved in a conflict at brigade level or higher along with the compliment air and sea forces. The simulation allows an analytical group to examine alternative courses of action in the development of operational war plans and to support an operational command group in conduct of simulations of real world exercises. TACWAR models two sides in a simulation, though several countries may be assigned to each side as allies.

Location: DOD-wide.

Proponent: Joint Staff / J8

Audience: CINCs, Joint Staff, OSD, and Service Components

POC: Steve Herndon, (913) 552-9257, herndons@trac.army.mil

Internet Site(s): <https://www.jointmodels.army.mil/tacwar/>

Viewed using Internet Explore (v. 5.5 or higher)



Advanced Concept
Exploration and
Analysis

Tank Weapons Gunnery Simulation System/Precision Gunnery System
(TWGSS/PGS)



System Description: The TWGSS is a precise laser “gun” attached to any Abrams series tank to simulate either the main gun (120mm or 105mm) and the coaxial machine gun (7.62 mm). The PGS is attached to the Bradley Fighting Vehicle and USMC Light Armored Vehicle. The simulator is integrated such that the crew must perform all gunnery functions as they would in real combat, including use of real targets downrange. The system includes AAR capability.

Location: World wide, including foreign distribution.

Proponent: PM-TRADE

Audience: Crew, Platoon, Company, and Battalion.

POC: Project Director, AMSTI-PMLTS, STRICOM, 12350 Research Parkway, Orlando, FL 32826-3276, (407) 384-5170, fax (407) 384-5815, DSN 970-5170

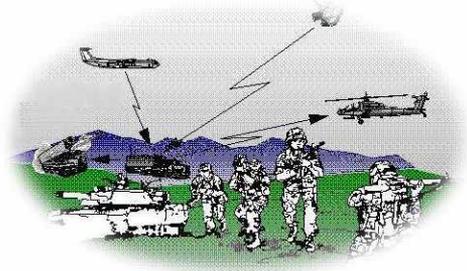
Internet Site(s):

<http://www.stricom.army.mil/PRODUCTS/TWGSS-PGS/>



Training, Exercises
& Military
Operations

Vector-In-Commander (VIC)



System Description: VIC is the U.S. Army's accredited combined arms analytical simulation of corps operations, with a theater slice in a joint context. The system features maneuver, fire support, C3I, CSS, engineer, ADA, and NBC modeling capability, to platoon level resolution. Joint representation includes air-to-ground, SEAD, and sensors for the Air Force; Naval gunfire and ADA for the Navy; and amphibious operations and ADA for the Marines. VIC is an event-sequenced, deterministic model with graphical playback. It is ALSP compliant

Location: TRAC, AMSAA, MICOM, Eng. School, CERL, WES, Artillery School, SAIC, OSD PARE, J8, Intel School, RAND, USMC, VRI, AST, TACOM.

Proponent: TRAC

Audience: Corps and Echelons Above Corps.

POC: TRAC – Leavenworth (913) 684-9255, DSN 552-9255,

Internet Site(s): <http://www.trac.army.mil/vic/>



Advanced Concept
Exploration and
Analysis

Warfighters Simulation 2000 (WARSIM 2000)



System Description: WARSIM 2000 will allow Command Posts (CCP) at all echelons to train in a realistic distributed interactive simulation environment. The system will incorporate established FAMSIM strengths with advanced capabilities. Enhanced realism will allow units to synchronize simulated and live operations. CP's will be able to interact using organic weapons for field training and AAR's will consist of useable training feedback.

Location: Under development

Proponent: National Simulation Center (NSC)

Audience: Battalion, Brigade, Division, Corps, and EAC.

POC: WARSIM Director, National Simulation Center, ATTN: ATZL-NSC-W, 410 Kearney Avenue, Building 45, Fort Leavenworth, KS 66027-1306, (913) 684-8252, fax (913) 684-8299, DSN 552-8252, STRICOM Project Manager WARSIM: (407) 384 – 3650 DSN 970 – 3650

Internet Site(s): <http://www-leav.army.mil/nsc/warsim/index.htm>
<http://www.stricom.army.mil/PRODUCTS/WARSIM/home.html>
http://www.stricom.army.mil/STRICOM/DRSTRICOM/SOFTWARE/SUMMARIES/w2k_sum1.html



Research,
Development
& Acquisitions



Training, Exercises
& Military
Operations

APPENDIX A:
THE SMART MEMORANDUM

APPENDIX A:
THE SMART MEMORANDUM



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY
ACQUISITION LOGISTICS AND TECHNOLOGY
103 ARMY PENTAGON
WASHINGTON DC 20310-0103

03 NOV 1999

SAAL-DO

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Army Vision and Goals for Simulation and Modeling for Acquisition, Requirements and Training (SMART)

The SMART Strategic Planning Workshop was conducted on August 30, 1999, with the purpose of bringing the senior leadership together to develop a vision statement and strategic goals for the SMART initiative. Participants in the workshop agreed upon the following vision statement for SMART:

"Be a world leader in M&S to continuously improve Army effectiveness through a disciplined collaborative environment in partnership with industry, government, and academia."

Using the aspects of the vision statement, the workshop participants developed four strategic goals:

Strategic Goal 1: Promote comprehensive modeling and simulation (M&S) policies, disciplined processes, and a high performance workforce to stimulate innovation and agility in developing enhanced Army capability.

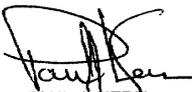
Strategic Goal 2: Establish a means to continuously and quantitatively measure, in a joint environment, life cycle cost and relevant measures of effectiveness.

Strategic Goal 3: Create and maintain disciplined collaborative M&S environments for all stakeholders to exchange and reuse data and information to support "SMART" modernization decisions.

Strategic Goal 4: Establish habitual associations and incentives to leverage the investments and inventions of academia, industry, and other government partners so that the Army benefits from the synergy of mutual investments.

Acting on behalf of the Army Model and Simulation Executive Council, we approve this vision and strategic goals for the Army's SMART initiative. This vision and its accompanying goals are a key step in the continuing process of institutionalizing SMART in the Army.


LARRY R. ELLIS
Lieutenant General, GS
Deputy Chief of Staff
for Operations and Plans


PAUL J. KERN
Lieutenant General, GS
Military Deputy to the
Assistant Secretary of the
Army (Acquisition, Logistics
and Technology)


Walter W. Hollis
Deputy Under Secretary of the Army
(Operations Research)

APPENDIX B:
ACRONYMS

ACAT	Acquisition Category
ACR	Advanced Concepts and Requirements
ACT	Advanced Concept and Technology
ADCSOPS	Assistant Deputy Chief of Staff for Operations and Plans
ADO	Army Digitization Office
ADS	Advanced Distributed Simulation
AEA	Army Enterprise Architecture
AIS	Automated Information System
ALSP	Aggregate Level Simulation Protocol
AMC	U.S. Army Materiel Command
AMIP	Army Model Improvement Program
AMS GOSC	Army Model and Simulation General Officer Steering Committee
AMSAA	Army Materiel Systems Analysis Activity
AMSEC	Army Model and Simulation Executive Council
AMSMP	Army Model and Simulation Management Program
AMSMP WG	Army Model and Simulation Management Program Working Group
AMSO	Army Model and Simulation Office
AMSTR	Army Model and Simulation Technology Review
AoA	Analysis of Alternatives
AR	Army Regulation
ARI	U.S. Army Research Institute for Behavioral and Social Sciences
ASWG	Advanced Simulation Working Group
ATD	Advanced Technology Demonstration
AV 2010	Army Vision 2010
AWC	Army War College
AWE	Advanced Warfighting Experiment
AAE	Army Acquisition Executive

AAN	Army After Next
C4I	Command, Control, Communications, Computers, and Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CAA	Concepts Analysis Agency
CAIV	Cost as an Independent Variable
CEAC	Cost and Economic Analysis Center
CG	Commanding General
CGF	Computer Generated Forces
CINC	Commander-in-Chief
COE	Common Operating Environment
CSA	Chief of Staff
DA	Department of the Army
DARPA	Defense Advanced Research Projects Agency
DCG	Deputy Commanding General
DCSINT	Deputy Chief of Staff for Intelligence
DCSLOG	Deputy Chief of Staff for Logistics
DCSOPS	Deputy Chief of Staff for Operations and Plans
DCSPER	Deputy Chief of Staff for Personnel
DCSSA	Deputy Chief of Staff for Simulations and Analysis
DII	Defense Information Infrastructure
DIS	Distributed Interactive Simulation
DISA	Defense Information Systems Agency
DISC4	Director of Information Systems for Command, Control, Communications, and Computers
DISN	Defense Integrated Services Network
DMSO	Defense Modeling and Simulation Office
DMSTTIAC	Defense Modeling, Simulation, and Tactical Technology Information and Analysis Center
DoD	Department of Defense

DSI	Defense Simulation Internet
DTD	Digital Topographic Data
DUSA (OR)	Deputy Under Secretary of the Army (Operations Research)
EAC	Echelons Above Corps
EUSA	Eighth U.S. Army
FFRDC	Federally Funded Research and Development Center
FOA	Field Operating Agency
FORSCOM	U.S. Army Forces Command
FTP	File Transfer Protocol
FY	Fiscal Year
GO	General Officer
GOSC	General Officer Steering Committee
GS	General Schedule
HLA	High Level Architecture
HQDA	Headquarters, Department of Army
IAW	In Accordance With
ICT	Integrated Concept Team
IV&V	Independent Verification and Validation
JMASS	Joint Modeling and Simulation System
JROC	Joint Requirements Oversight Council
JSIMS	Joint Simulation System
JTA	Joint Technical Architecture
JTF	Joint Task Force
JWARS	Joint Warfare System
M&S	Model(s) and Simulation(s)--Used in singular and plural
MACOM	Major Command
MAIS	Major Automated Information System
MAP	Major Defense Acquisition Programs
MDEP	Management Decision Package
MNS	Mission Needs Statement

ModSAF	Modular Semi-Automated Forces
MOOTW	Military Operations Other Than War
MSEA	M&S Executive Agent
MSOSA	Modeling and Simulation Operational Support Activity
MSRD	Model and Simulation Requirements Document
MSRR	Model and Simulation Resource Repository
MTMC	Military Traffic Management Command
MTMCTEA	Military Traffic Management Command Transportation Engineering Agency
NGB	National Guard Bureau
NIMA	National Imagery and Mapping Agency
NPR	National Performance Review
NSC	National Simulation Center
OCAR	Office of the Chief, Army Reserve
OneSAF	One Semi-Automated Force
ORD	Operational Requirements Document
OSD	Office of the Secretary of Defense
PAED	Army Program Analysis and Evaluation Directorate
PDU	Protocol Data Unit
PEG	Program Evaluation Group
PEO	Program Executive Officer
PM	Program Manager
POC	Point of Contact
POM	Program Objective Memorandum
PPBES	Planning, Programming, Budgeting, and Execution System
PPBS	Planning, Programming, and Budgeting System
QA	Quality Assurance
R&D	Research and Development
RDA	Research, Development, and Acquisition
RDEC	Research, Development, and Engineering Center

RIA	Requirements Integration and Approval
RIC	Requirements Integration Council
RIWG	Requirements Integration Working Group
S&T	Science and Technology
SAF	Semi-Automated Force
SBA	Simulation Based Acquisition
SCC	Standards Category Coordinator
SEDRIS	Synthetic Environment Data Representation and Interchange Specification
SES	Senior Executive Service
SIMTECH	Simulation Technology
SMDC	Space and Missile Defense Command
SSA	Staff Support Agency
SSP	Simulation Support Plan
STAMIS	Standard Management Information System
STOW	Synthetic Theater of War
STOW-A	Synthetic Theater of War-Architecture
STRICOM	Simulation, Training, and Instrumentation Command
T&E	Test and Evaluation
TAFIM	Technical Architecture Framework for Information Management
TEA	Transportation Engineering Agency
TEC	Topographic Engineering Center
TEMO	Training, Exercises, and Military Operations
TP	TRADOC Pamphlet
TRADOC	Training and Doctrine Command
USACE	United States Army Corps of Engineers
V&V	Verification and Validation
VCSA	Vice Chief of Staff of the Army
VV&A	Verification, Validation, and Accreditation

VV&C	Verification, Validation, and Certification
WARSIM	Warfighters' Simulation
WG	Working Group
WWW	World Wide Web

APPENDIX C: **DEFINITIONS**

The following definitions are drawn from AR 5-11:

Accreditation. The official determination that a model, simulation, or federation of M&S is acceptable for use for a specific purpose.

Advanced Concepts and Requirements (ACR) Domain. One of the three domains for Army M&S applications. ACR includes experiments with new concepts and advanced technologies to develop requirements in doctrine, training, leader development, organizations, materiel and soldiers which will better prepare the Army for future operations.

Computer Generated Forces (CGF). A capability/technology where computer generated forces are a doctrinally correct representation of both friendly and opposing forces. These forces will support simulations by providing opposing forces, supporting forces, and forces needed to permit a smaller number of personnel to represent a much larger force.

Configuration management. The application of technical and administrative direction and surveillance to identify and document the functional and physical characteristics of a M&S, control changes, and record and report change processing and implementation status.

Constructive M&S. M&S that involve real people making inputs into a simulation that carries out those inputs by simulated people operating simulated systems.

Data Standards. A capability that increases information sharing effectiveness by establishing standardization of data elements, data base construction, accessibility procedures, system communication, data maintenance, and control.

Data Verification, Validation, and Certification (VV&C). The process of verifying the internal consistency and correctness of data, validating that it represents real-world entities appropriate for its intended purpose or an expected range of purposes, and certifying it as having a specified level of quality or as being appropriate for a specified use, type of use, or range of uses. The process has two perspectives: producer and user process.

Distributed Interactive Simulation (DIS). A subset of advanced distributed simulation which interfaces through the use of a DIS Protocol Data Unit (PDU).

High Level Architecture (HLA). Major functional elements, interfaces, and design rules, pertaining as feasible to all DoD simulation applications and providing a common framework within which specific system architectures can be defined.

Interoperability. The ability of a set of M&S to provide services to and accept services from other M&S and to use these exchanged services to enable them to operate effectively together.

Live Simulation. A representation of military operations using live forces and instrumented weapon systems interacting on training, test, and exercise ranges which simulate experiences during actual operational conditions.

Model. A model is a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process.

Model Types. (1) Physical model. A physical representation of the real world object as it relates to symbolic models in the form of simulators. (2) Mathematical model. A series of mathematical equations or relationships that can be discretely solved. This includes M&S using techniques of numerical approximation to solve complex mathematical functions for which specific values cannot be derived (e.g., integrals). (3) Procedural model. An expression of dynamic relationships of a situation expressed by mathematical and logical processes. These models are commonly referred to as simulations.

M&S Activity. The development and maintenance of a computer-based M&S capability by or for organizations of the U.S. Army.

M&S Developer. The organization responsible for developing, managing, or overseeing M&S developed by a DoD component, contractor, or Federally Funded Research and Development Center (FFRDC). The developer may be the same agency as the proponent agency.

M&S Proponent. The organization responsible for initiating the development and directing control of the reference version of a model or simulation. The proponent will develop and execute a viable strategy for development and maintenance throughout the life cycle of the M&S; and for directing the investment of available resources in same. The M&S proponent serves as the advocate and final authority on their M&S. The proponent will advise the DUSA(OR) on release of the M&S to foreign countries, and will advise the MACOM or Organizational Release Authority for domestic release.

Except where responsibilities are specifically designated to an acquisition official by DoD or DA policy e.g. DoD 5000.2 or AR 70-1, the M&S proponent is responsible for, but may delegate execution of: M&S Development; Configuration Management; Preparation and Maintenance of Simulation Object Models (SOMs) as appropriate; all aspects of Verification and Validation; and maintenance of current information in all catalogs and repositories.

Modeling and Simulation. The development and use of live, virtual, and constructive models including simulators, stimulators, emulators, and prototypes to investigate, understand, or provide experiential stimulus to either (1) conceptual systems that do not exist or (2) real life systems which cannot accept experimentation or observation because of resource, range, security, or safety limitations.

Research, Development, and Acquisition (RDA) Domain. One of the three domains for Army M&S applications. Includes all M&S used for design, development, and acquisition of weapons systems and equipment. M&S in the RDA domain are used for scientific inquiry to discover or revise facts and theories of phenomena, followed by transformation of these discoveries into physical representations. RDA also includes Test and Evaluation (T&E) where M&S are used to augment and possibly reduce the scope of real-world T&E.

Simulation. A method for implementing a model(s) over time.

Simulator

- (1) A device, computer program, or system that performs simulation.
- (2) For training, a device which duplicates the essential features of a task situation and provides for direct practice.
- (3) For Distributed Interactive Simulation (DIS), a physical model or simulation of a weapons system, set of weapon systems, or piece of equipment which represents some major aspects of the equipment's operation.

Standard. A rule, principle, or measurement established by authority, custom, or general consent as a representation or example.

Standards Categories. The elements of the framework for M&S standardization. The Standards framework contains all the things the Army M&S community seeks to represent algorithmically, devolved into Categories which are assigned to the Army agencies best suited to coordinate development and maintenance of standards in the technical regime represented by that category.

Stimulator. (1) A hardware device that injects or radiates signals into the sensor system(s) of operational equipment to imitate the effects of platforms, munitions, and environment that are not physically present. (2) A battlefield entity consisting of hardware and/or software modules which injects signals directly into the sensor systems of an actual battlefield entity to simulate other battlefield entities in the virtual battlefield.

Synthetic Environments (SE). Internetted simulations that represent activities at a high level of realism from simulations of theaters of war to factories and manufacturing processes. These environments may be created within a single computer or a vast distributed network connected by local and wide area networks and augmented by super-realistic special effects and accurate behavioral models. They allow visualization of and immersion into the environment being simulated. (Ref. DoD 5000.59-P; CJSI 8510.01)

Test and Evaluation (T&E). Test and evaluation includes engineering, developmental, and operational tests.

Training, Exercises, and Military Operations (TEMO) Domain. One of the three domains for Army M&S applications. TEMO includes most forms of training at echelons from individual simulation trainers through collective, combined arms, joint, and/or combined exercises. TEMO includes mission rehearsals and evaluations of all phases of war plans. Analysis conducted during the rehearsal or evaluation validates the plan as best as the simulation environment will allow.

Validation. The process of determining the extent to which a M&S is an accurate representation of the real-world from the perspective of the intended use of the M&S. Validation methods include expert consensus, comparison with historical results, comparison with test data, peer review, and independent review.

Verification. The process of determining that a M&S accurately represents the developer's conceptual description and specifications. Verification evaluates the extent to which the M&S has been developed using sound and established software engineering techniques.

Virtual M&S. A synthetic representation of warfighting environments patterned after the simulated organization, operations, and equipment of actual military units.