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SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Technical Information Center (DTIC).

# SURVIAC

## Bulletin

### The Aeronautical Systems Center (ASC) Logistics Composite Model (LCOM) and Key Performance Parameters (KPPs) *By Frank Erdman, ASC/ENDR*

#### Introduction

The Aeronautical Systems Center (ASC) Logistics Composite Model (LCOM) is a government-owned software simulation tool used to investigate reliability, availability, maintainability and supportability (RAMS) capabilities and modernization issues of weapon systems, including modifications for enhanced aircraft survivability. LCOM is a tool with a long legacy of use, and ASC LCOM continues to advance that legacy with regular enhancements. ASC LCOM is the RAMS simulation tool of choice for supporting decision makers during all phases of the system life cycle.

#### New Policy

In July 2006, the Joint Requirements Oversight Council (JROC) established mandatory materiel readiness and sustainment outcome metrics for weapon system acquisitions. The metrics were defined as the Key Performance Parameter (KPP) *Materiel Availability* and the Key System Attributes (KSAs) *Materiel Reliability* and *Ownership Cost*.

On 10 Mar 2007, the Deputy Under Secretary of Defense for Logistics and Materiel Readiness in a policy memorandum entitled *Life Cycle Sustainment Outcome Metrics*, directed reporting of the KPP/KSA sustainment outcome metrics for weapon system acquisition programs.

On 1 May 2007, the KPP/KSA metrics appeared in the revised Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3170.01C entitled *Operation of the Joint Capabilities Integration and Development System (JCIDS)*.

Subsequent policies and instructions issued by the Department of Defense (DOD) and the military services have furthered the adoption and implementation of the materiel readiness and sustainment metrics. The metrics



are mandatory for ACAT I and other designated programs. ACAT II programs and below can be excluded but must submit supporting rationale for approval.

By direct calculation of system availability and many other RAMS metrics, ASC LCOM offers the vital simulation capability needed to directly support system acquisition and modernization decisions, and the corresponding milestones. It is important to understand and address this critical step when making the case for survivability enhancements as well.

#### Users

While new acquisition programs such as the Air Force's KC-X tanker program are planning for use of ASC LCOM as outlined in the Request for Proposal (RFP) solicitation FA8625-10-R-6600, ongoing programs such as the F-22 and F-35 have been using ASC LCOM for many years in support of

# Report Documentation Page

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### Send us your feedback!

We would like to hear from you. Have we helped you in some way? How can we improve? Would you like to author an article for a future issue? What issues would you like to see discussed in upcoming bulletins? Modeling & Simulation? Homeland Defense/ Homeland Security? Space Survivability Issues? Unmanned Aerial Systems? Please e-mail your comments to [surviac@bah.com](mailto:surviac@bah.com).

*LCOM continued from page 1.*

sustainment KPPs established prior to the 2006/2007 policy directives. Many other programs also use ASC LCOM.

## Analysis Capability

ASC LCOM is a discrete-event simulation tool employing resource queuing, stochastic processes and Monte Carlo methods. It has a long legacy of use supporting capability assessments and trade-off studies for a wide variety of weapon systems. It is maintained by the ASC Engineering Division at Wright-Patterson AFB and is currently in use by acquisition planning and program offices throughout the Department of Defense and by international partners.

Use of ASC LCOM requires an input dataset describing the operational unit, weapon system, maintenance concept, and mission schedule. This includes specifying the number of aircraft and operating locations, the components which comprise the weapon system, the pre-sortie and post-sortie processes and activities required for operation and maintenance, level of repair and associated support equipment and facilities, corresponding personnel and spares levels, and the flying schedule.

The weapon system is specified in terms of a hierarchical breakdown, usually in terms of Work Unit Code (WUC) or a similar structure, and includes corresponding failure rates and spares levels. Pre-sortie and post-sortie processes and activities are specified in terms of a network of tasks and include the time and resources (personnel, parts/spares, support equipment, facilities) required for task completion.

ASC LCOM offers great flexibility in defining the level of detail for the simulation. A single operational unit or squadron can be modeled, or the analyst may specify units at multiple locations including multiple aircraft types.

ASC LCOM does not require that the weapon system be defined to any particular level of detail. Component detail is flexible and variable and can be adjusted to suit analysis objectives. For example one component can be modeled to the 5-digit level, while others can be modeled to the 3-digit level or not modeled at all.

Task networks are typically defined to include processes for pre-sortie launch, post-sortie recover, and scheduled and unscheduled maintenance. Additional flexibility exists to accommodate modeling of weapon system configurations, deferred maintenance, cannibalization, task priority and pre-emption, and resource substitution.

Flexibility exists to model usual levels of repair for flight-line, shop, depot, or any unique situation to accommodate analysis

objectives. Task network structure offers typical programming constructs to support highly detailed networks involving variables, branching, looping, subroutines, etc.

## Current Status

ASC LCOM has been enhanced to provide over 200 output statistics which detail and summarize simulation results. A collection of several pre and post processors are available to assist analysts in review, analysis, and documentation of simulation results. They include tools for graphical display and editing of task networks, debugging and profiling of model data and simulation operation, plotting and charting of output statistics, and optimization of spares and manpower levels.

ASC LCOM has been continually updated and modernized and offers regular releases for bug repair and feature enhancements. A multi-volume set of documentation is maintained.

More recently ASC LCOM was enhanced to offer support for multiple CPU cores and parallel processing. A completely revised user interface was recently introduced which offers a modern software suite of integrated support tools, enhanced simulation control, and features for study configuration management.

ASC LCOM 3.1 is the current release. Release 3.2 is planned for Q2 2011 and will offer enhancements for increased performance, study management, and direct calculation of system Operational Availability (A<sub>o</sub>).

ASC LCOM requires a modern PC workstation running Microsoft Windows XP or later. Microsoft Excel 2007 or later is required for postprocessor operation.

## Distribution

ASC LCOM is government owned and maintained by ASC/EN, Wright-Patterson AFB, Ohio. It is available at no cost to government offices and their contractors in support of official programs or projects. Contractors must identify a sponsoring government office.

To obtain the latest ASC LCOM release contact [asclcom@wpafb.af.mil](mailto:asclcom@wpafb.af.mil), 937-255-8060, or ASC/ENDR, 1970 Monahan Way, Wright-Patterson AFB, OH 45433.

# Aircraft Combat Occupant Casualty Assessment State of the Art Report (SOAR)

SURVIAC recently completed the Aircraft Combat Occupant Casualty Assessment State of the Art Report (SOAR) sponsored by the Joint Aircraft Survivability Program (JASP). The JASP has funded an initiative, through JASP project M-08-09 "Aircraft Combat Occupant Casualty", to incorporate crew and passenger casualty assessments into aircraft survivability evaluations. The goal of the project is to include aircraft occupant casualty reduction as a vulnerability design consideration in the acquisition process. The delivery of the SOAR was one piece of the three year, FY 2008 to FY 2011, effort to develop an interim methodology and a roadmap to improve that methodology.

The focus for an interim methodology is the capability to assess the personnel survivability features of the aircraft design. Once a methodology is in place, then more stringent requirements can be placed on the aircraft design evaluation. An evaluation method also facilitates design trade studies to further increase capability. Future Test and Evaluation Master Plans for aircraft acquisition programs will contain requirements to evaluate the impact of aircraft vulnerability on the crew and passengers. Current vulnerability assessments, as described in the SOAR, provide only a portion of the necessary information.

In order to develop the roadmap for the improvement of the interim methodology, relevant data and resources needed to be identified and documented. The first portion of the project involved researching the agencies that gather or produce data that could feed the crew and passengers survivability assessments. A JASP-sponsored Aircraft Combat Occupant Casualty Workshop was held 13 to 15 January 2009. The objective of the workshop was to assess state-of-the-art casualty data and discuss current casualty metrics, evaluation techniques, and methodologies in addition to identifying the occupant casualty analysis areas for further data collection. Vulnerability test and evaluation representatives from the three services participated in the workshop. Additionally, there were several other government organizations that presented their perspectives and capabilities related to passenger survivability analysis and tests. These organizations included the Federal Aviation Administration (FAA), the National Aeronautics and Space Administration (NASA-Langley), the National Transportation Safety Board (NTSB), the National Highway Traffic Safety Administration, and DoD safety centers and aeromedical experts. Several analytical frameworks and test techniques for evaluating combat casualties from



initial ballistic aircraft penetration through a safe landing and egress were proposed by aircraft survivability experts from within all the Services. The information received at the workshop formed a strong basis for the development of the SOAR

The SOAR is organized into six sections. Sections 1-3 provide the basis for understanding crew and passenger survivability. Section 1 provides the background and future of the project. Section 2 provides the conceptual, analytical and historical foundation for assessing casualties. Section 3 describes how the Department of Defense investigates, reports, and keeps related records on accidental death, injury, occupational illness, and property damage for DoD accidents. Section 4 contains the data collection portion of the SOAR and was based on the occupant casualty analysis areas that were identified at the January 2009 Casualty Workshop. These areas included combat related casualties during in-flight escape, crash events, and post crash egress. Section 4 also discusses the available data and related organizations that currently are involved with protecting crew and passengers in both civilian and military airframes. Section 5 discusses current uses of modeling and simulation tools in aviation safety programs. The last section discusses the future challenges and recommendations for the Aircraft Combat Occupant Casualty project. The SOAR is available to U.S. Government Agencies and their contractors through SURVIAC.

*For more information contact SURVIAC at (937) 255-3828, DSN 785-3828: SOAR Information - Mr. Jonathan Smith, SOAR Purchase - Mr. A.J. Brown*

# USARIEM Partners with SURVIAC to Develop Military Nutrition Website

by Michael E. Smith, SURVIAC

When the soldier in Afghanistan opens his MRE, does he take time to think about the engineering and thought that went into producing it? Years of research have gone into making a meal that has the right balance of nutrients and vitamins, that gives him or her the energy they need to keep going. That keeps for years, and that can still be relatively tasty.

Unlikely that any soldier thinks about it, and yet, years of research and engineering have gone into that MRE and all the other nutrition resources used by the warfighter. The research is done by scientists and nutritionists at the United States Army Research Institute of Environmental Medicine (USARIEM), in the Quartermaster Corps, and other research organizations.

A new website tells the comprehensive story of historical efforts by the US military to provide healthy, nutritious foods and food supplements to soldiers, whether deployed in hostile territory, dangerous climates, or right here at home. This new website has been developed by the Army Medical Research and Materiel Command (AMRMC) and USARIEM, and

designed and maintained by members of SURVIAC's Human Systems Integration team. Colonel Karl Friedl, Director of Telemedicine and Advanced Technology Research Center (TATRC), started this initiative when he found out that his former boss, retired COL Dave Schnakenberg, PhD, had acquired hundreds of research documents detailing the history of military nutrition efforts that dated back to the early 20<sup>th</sup> century. The documents, unclassified technical reports and journal articles, form the core of a new research collection. This collection is made available to researchers and the public through a fee-free, no-subscription website designed to introduce researchers to the history of military nutrition

research in the United States. [Military-Nutrition.com](http://Military-Nutrition.com) has been developed to tell this story.

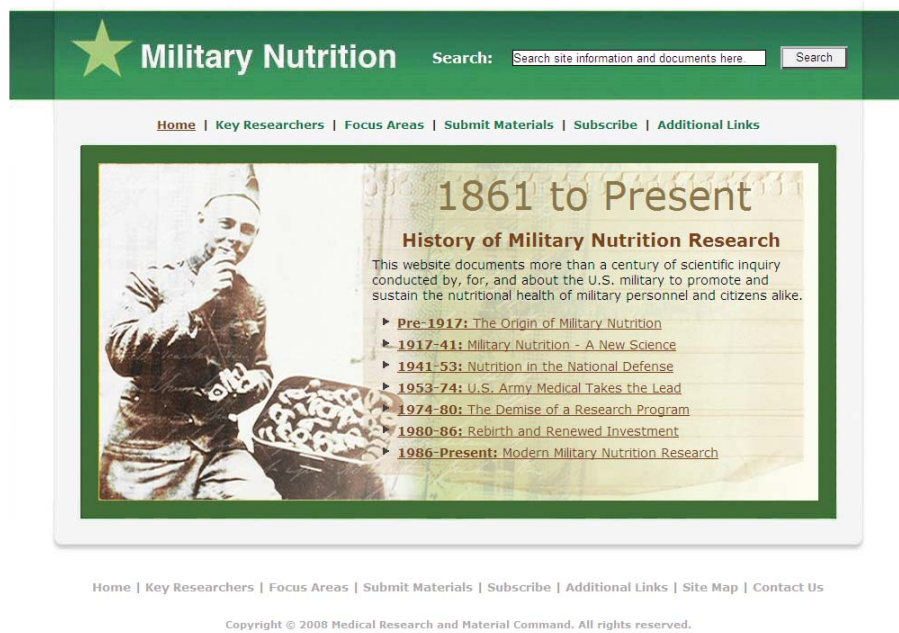
Using this resource, the researcher can read summaries of the historical eras of military nutrition research efforts, from before the First World War, to the present. Each of seven eras is outlined, noting the personalities, facilities, and kinds of research that were conducted during those eras.

Key researchers from each era, whose insight and diligence led to important advances in the field of military nutrition, are identified, with links to further online information. In addition, the research areas of greatest interest to military scientists and nutritionists, are explained in detail, with historical documentation linking to materials in the database, and to external

reference sources. Also provided are resources for contemporary, ongoing research, and links to important websites and organizations that are involved in research efforts, and/or further document the historical efforts of the military's nutrition experts.

The heart of the effort is, of course, the full-text-searchable database of historical documents. This

unique database, unavailable through other internet sources, details more than a century's worth of scientific research and information about nutrition-related processes, food lists, technologies, and military rations. Key decision briefings and memoranda that fill in historical gaps have also been included. New information is continually being added, and researchers are encouraged to share their own materials related to military nutrition, by submitting them for inclusion in the database. The database and website will continue to evolve, with the goal of becoming the premier source of information about historical and contemporary efforts to provide the warfighter the proper nutrition and energy to effectively execute military mission requirements and return home safely.



# UAVs: Not So Expendable Anymore

*This article first appeared on the DoD Armed with Science website: <http://science.dodlive.mil>*



USAF photo by Staff Sgt. Brian Ferguson

Unmanned Aerial Vehicles (UAVs), also known as Unmanned Aerial Systems (UASs) or drones, are sophisticated pilotless aircraft that serve as the eyes and ears for our troops on the ground. These vehicles routinely embark on risky reconnaissance missions that were previously performed by pilots. UAVs evolved tremendously over the years and are now an essential part of our mission, especially in remote locations where rough terrain makes things difficult.

Early on, survivability of the UAV was not a primary focus. Their main purpose was simply to reduce the need to send soldiers, sailors, airmen or Marines into risky situations. They were intended to be inexpensive and expendable. But over time, these machines have become more complex and play an even greater role in helping our troops accomplish their mission. Today, when a UAV does occasionally go down, a ground unit has been sent to recover it. Due to the rising cost of platforms and sensor packages as well as recent combat losses, the UAV community is considering survivability enhancements. And although there is no loss of life directly associated with the loss of a UAV, the potential loss of life, within units on the ground that depend on the UAV, is substantial. Survivability techniques and technologies developed for manned aircraft can be considered in order to offer cost-effective survivability enhancements for UAVs; but the vast amount of data from numerous sources made the task daunting.

Enter the Survivability/Vulnerability Information Analysis Center (SURVIAC). SURVIAC recently teamed with the National Defense Industrial Association (NDIA) Combat Survivability Division (CSD) to conduct two workshops specifically focused on enhancing survivability for UAVs,

bringing together experts across the aircraft survivability community to collaborate on leveraging existing technology to apply to unmanned systems. After the initial workshop, participants walked away in strong agreement that survivability should be formally considered in the design of all UAVs.

The second workshop focused on developing a total survivability solution. Participants recommended that the ideal solution include modular components, multi-platform capability, and should leverage existing sensor payloads. They also agreed that establishing self-protection requirements for UAVs is essential to ensuring our troops have the necessary eyes and ears to accomplish their mission. Summary reports on both workshops are available through SURVIAC, which can be reached via the IAC website at <http://iac.dtic.mil>.

The success and the survival of so many soldiers, sailors, sir-men and Marines is due, in no small part, to the intelligence and support provided by UAVs. Now that we depend on these UAVs, we need to ensure that they can survive as well.



USMC photo by Sgt Guadalupe M. Deanda III

## More About Armed With Science...

Armed with Science is a science and technology blog, which provides a better conduit to celebrate those men and women involved in cutting-edge research and development at the Department of Defense. In the spirit of science, the blog will also be an "experiment in progress," exploring new social technologies to better engage the public and continually evolving to meet the needs of our audience.

*(Source: <http://science.dodlive.mil/about>)*

# Introducing DTIC Online Access Control (DOAC)

DTIC Online Access Controlled (DOAC) [https://www.dtic.mil/?WT.mc\\_id=PS0001](https://www.dtic.mil/?WT.mc_id=PS0001) is the gateway to all of DTIC's science and technology resources.

On DOAC you will find many of the resources you relied on in Private STINET including:

- Technical reports, both citations and many full-text, downloadable documents
- Research summaries from 1965 to the present
- Independent Research and Development (IR&D) data
- DTIC's MultiSearch
- Bibliographies created using the "Standard" and "All Fields" displays and available as PDFs
- Additional "Help Tips" for Bibliographies, Saved Searches, and the Shopping Cart
- Search box on the "More Search Options" page for Accession
- Number In addition, DOAC offers access to the following DTIC products and services:
- DoDTechipedia, the S&T wiki
- Aristotle, the DoD professional networking tool
- Congressional budget data
- Research and Engineering (R&E) database
- Searches of multiple resources can be saved, modified and rerun
- Three citation display options are available for easier exporting
- Ability to add selected or all search results to a bibliography

DOAC allows you to access all of these resources from a single website with a single sign-on.

If you haven't already bookmarked DTIC Online Access Controlled for your use, please add this URL, <https://www.dtic.mil>. You may also access the site from the DOAC logo on our homepage, DTIC Online at <http://www.dtic.mil>. We encourage you to use DOAC as your main resource now.

For assistance with DOAC, contact DTIC staff at [dtic-online@dtic.mil](mailto:dtic-online@dtic.mil).

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The premier provider of DoD scientific and technical information, DTIC has served the information needs of the defense community for 65 years.



## Recent Tasks Awarded to SURVIAC

- Survivability and Vulnerability Technical Analyses for the Navy Expeditionary Combat Command.
- Survivable Naval Air Forces Requirements and Technical Analysis of Combat Operations for Naval Air Systems Command
- Survivability and Vulnerability Technical Analyses for U.S. Joint Forces Command Concept Development and Experimentation Directorate
- Biometrics, Identity Management, and Homeland Security Technologies Research and Analysis for Space and Naval Warfare Systems Center Atlantic

# First SURVIAC COTR Retires at Wright-Patterson Air Force Base

SURVIAC began its operation in December of 1984 under the Program Management of Mr. Gary B. Streets, who started his Air Force career at Wright-Patterson AFB in August 1972. Mr. Streets began as an aerospace engineer in aircraft combat survivability, working his way up from staff engineer to engineering supervisor. He was the lead for the collection and analysis of aircraft combat data from Southeast Asia for the Combat Data Information Center (CDIC), the forerunner to SURVIAC. After a successful career at the Air Force Space Command and the Space Warfare Center in Colorado, Gary was selected in 2003 as the AFRL Commander's Representative to HQ AFSPC. It is from this position that Mr. Streets has "retired and gone fishin". SURVIAC wishes to thank Gary for his knowledge and leadership that began the SURVIAC institution 27 years ago and wishes him a long and happy retirement!



Mr. Jack Blackhurst, AFMC, (L) presents the Outstanding Career Service Award to Mr. Gary Streets at his retirement ceremony



Col. Mark Nakanishi, AFRL, (L) presents Mr. Streets with a gift of appreciation for his years of service.

## SURVIAC Survivability Expert retires



One of SURVIAC's key survivability analysts, Matt Kolleck, has retired after 23 years of service to SURVIAC.

Matt began his journey as a nuclear weapons technician in the US Army from 1968 to 1971.

From there he worked as a survivability/vulnerability engineer in the Deputy for Engineering branch at Wright-Patterson Air Force Base, where he optimized aircraft survivability by means of basic design considerations. His engineering skills encompassed analyses of A-10, F-15, F-111, and B-1A aircraft.

In the mid 1970s through the late 1980s, Matt served as an Operations

Research and Financial Analyst for the Mead Corporation, a Corporate Planning Manager for Phillips Industries, Director of Management Systems of Miami Valley Hospital and Project Leader for Support Systems Associates, all in Dayton, Ohio.

In 1988, Matt joined the team of Booz Allen Hamilton and SURVIAC. His accomplishments here included support to the Halon Replacement Program for aviation, a joint DoD/FAA program to find a replacement for Halon as a fire-extinguishing agent. He became the Project Manager for other fire suppression related efforts, including a study of actual costs of fire to the Air Force.

Matt was the Project Lead for F-22 engine nacelle fire suppression program, the objective of which was to determine the ability of the F-22 and F-16 engine nacelle fire suppression systems.

Matt also led an effort to conduct a vulnerability assessment of seven of the current fleet of Unmanned Aircraft Systems. Matt also applied his vulnerability expertise to the Space Station Freedom, where he conducted vulnerability assessments of the space station in orbit to micro-meteorites.

He has served as an Adjunct instructor at the Air Force Institute of Technology (AFIT) where he taught the Aircraft Survivability course for two years.

Matt's dedication, contributions, and accomplishments have impacted the survivability/vulnerability community in many diverse areas during his tenure with SURVIAC. We wish him all the happiness in his well deserved retirement!

# Models Distributed by SURVIAC

The Survivability/Vulnerability Information Analysis Center (SURVIAC) is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Technical Information Center (DTIC)

Acronym	Model Name	Version No.
AIRADE	Airborne Radar Detection Model	7.4
ALARM	Advanced Low Altitude Radar Model (Includes EARCE 3.4)	5.4
BLUEMAX 5	Variable Airspeed Flight Path Generator	1.0.2
BRAWLER	Air-to-Air Combat Simulation	7.3
BRL-CAD	Ballistic Research Laboratory Computer-Aided Design Package	7.14.8
*COVART	Computation of Vulnerable Area Tool	6.2
ESAMS	Enhanced Surface-to-Air Missile Simulation	4.3
*FASTGEN	Fast Shotline Generator	6.1
*FATEPEN	Fast Air Target Encounter Penetration Program	3.3.8
FPM	Fire Prediction Model	3.8
IVIEW 2000	Graphical User Interface for Output Simulation	1.0E
JSEM	Joint Service Endgame Model	1
LELAWS	Low Energy Laser Weapons Simulation	3.0
RADGUNS	Radar-Directed Gun System Simulation	2.4.1

\* Part of Vulnerability Toolkit v6.2. For further information on how to obtain these models and how to establish need-to-know certification, please contact SURVIAC at (937) 255-3828 or DSN 785-3828. Requests from non-U.S. Agencies must be forwarded to their country's Embassy in Washington, DC, Attention: Air Attache's Office.

## Brawler 7.3 Released

SURVIAC has begun distributing the newest classified and unclassified version of BRAWLER v7.3. These programs and their upgrades are funded by HQ USAF/A9 with administrative support provided by the Joint Aircraft Survivability Program Office (JASPO).

The new version of BRAWLER v7.3 model is an update from BRAWLER v7.2. Major enhancements new to this version include:

- Digital Radio Frequency Memory (DRFM) modeling enhancements
- Directed Energy modeling enhancements, including Dynamic Aimpoint Laser Engagement (DALE) model interface
- New NASIC TMAP missile model interfaces
- NASIC RWR Enhancement
- RULES set releases
- New plotting package

BRAWLER simulates air-to-air combat between multiple flights of aircraft in both the visual and beyond-visual-range (BVR) arenas. This simulation of flight-versus-flight air combat is considered to render realistic behaviors of military fighter pilots. BRAWLER incorporates value-driven and information oriented principles in its structure to provide a Monte Carlo, event-driven simulation of air combat between multiple flights of aircraft with real-world stochastic features. The user decides the pilot's decision process including:

- Missions and tactical doctrines
- Aggressiveness
- Perceived capability of the enemy
- Reaction time
- Quality of the decisions made
- Supported Platform: Linux

You can obtain the new version of BRAWLER v7.3 from SURVIAC. SURVIAC can be reached at (937) 255-3828, DSN 785-3828. Order requests should be directed to Mr. AJ Brown.

# Products Distributed by SURVIAC

The Survivability/Vulnerability Information Analysis Center (SURVIAC) is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Technical Information Center (DTIC)

Product	Cost
A Critical Review of Graphite Epoxy Laser Damage Studies	Free
A Summary of Aerospace Vehicle Computerized Geometric Descriptions for For Vulnerability Analyses	Free
Advanced Materials for Enhanced Survivability	Free
Aircraft Combat Occupant Casualty Assessment State-of-the-Art Report (SOAR)	\$ 50.00
Aircraft Combat Survivability Self Study Program (SSSP) CD (or download from SURVIAC website)	Free
Aircraft Fuel System Fire and Explosion Suppression Design Guide	Free
"Aircraft Survivability" Video	Free
Alternatives for Halon 1301 in Ground Vehicle Firefighting Systems	\$ 50.00
An Overview of Laser Technology and Applications	Free
An Overview of Laser-Induced Eye Effects	Free
Aircraft Asymmetric Threat Survivability Workshop <b>Summary</b> Report	Free
Aircraft Asymmetric Threat Survivability Workshop Report (Full Report)	\$ 50.00
"Battle Damage Repair of Composite Structures" Video	Free
Collection of Vulnerability Test Results for Typical Aircraft Systems and Components	\$ 75.00
Comparative Close Air Support Vulnerability Assessment Study - Executive Summary	Free
Component Vulnerability Workshop Component Pd/h Handbook	\$200.00 (Free to Gov't)
Component Vulnerability Analysis Archive (CVAA) and Workshop Notes	\$300.00 (Free to Gov't)
Component Vulnerability Database Development	Free
Computerized Geometric Information to Support Vulnerability Assessments State-of-the-Art Report	\$ 75.00
Continuity of Operations (COOP) State-of-the-Art Report (SOAR)	\$ 50.00
Countermeasures Handbook for Aircraft Survivability	Free
Critical Review and Technology Assessment (CRTA) for Soldier Survivability (Ssv)	Free
"Designing for Survivability" Video	Free
Directed Energy Effectiveness Modeling State-of-the-Art Report (SOAR)	\$ 50.00
DREAM Sensitivity Study	\$ 50.00
"Fundamentals of Ground Combat System Ballistic Vulnerability/Lethality" by Dr. Paul Deitz	Free - Gov't only*
Gas Explosion Suppression Agent Investigation	\$200.00
Joint Aircraft Survivability Program (JASP) Promotional Video	Free
Lessons Learned from Live Fire Testing	\$ 50.00 (Free to Gov't)
MANPADS Threats to Aircraft: A Vulnerability Perspective, February 2000, Final Report	\$200.00
Missile Warhead Bomb and Propellant Response State-of-the-Art Report (SOAR)	\$ 50.00
MOSAIC Sensitivity Study	\$ 50.00
National MANPADS Workshop: A Vulnerability Perspective, Proceedings - 2 volumes	\$200.00
Night Vision Goggle (NVG) Rocket Propelled Grenade (RPG) Quick Look Report (QLR) CD	\$ 50.00 (Free to Gov't)
Penetration Characteristics for Advanced Engine Materials	Free
Proceedings of the Eighth DoD Conference on DEW Vulnerability, Survivability, and Effects - 2 Volumes	\$100.00 / per set
RADGUNS 1.8 Parametric Study	\$100.00 (Free to Gov't)
Ship Survivability Overview	Free
SOAR on Directed Energy Weapon (DEW) Assessment Methods	\$ 50.00
State-of-the-Art (SOAR) for Non-Lethal Weapon (NLW) Assessment Methodologies	\$ 50.00
"SURVIAC - A Capabilities Overview" Video	Free
SURVIAC Model Guide	Free
Survivability Analysis Workshop Notebook 2005	\$100.00
"The Fundamentals of Aircraft Combat Survivability Analysis and Design" second edition, by Robert E. Ball	Free - Gov't Only*
"Threat Effects in Aircraft Combat Survivability" Video (2006)	\$ 50.00 (Free to Gov't)
UAV Survivability Enhancement Workshop <b>Summary</b> Report	Free
UAV Survivability Enhancement Workshop Report	\$ 50.00
Vulnerability Reduction Workshop <b>Summary</b> Report	Free

For further information on how to obtain these products and how to establish need-to-know certification, please contact SURVIAC at (937) 255-3828 or DSN 785-3828. Requests from non-U.S. Agencies must be forwarded to their country's Embassy in Washington, DC, Attention: Air Attache's Office.

# Calendar of Events

## SEPTEMBER 2011

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2011 ITEA Annual Symposium - Fostering Partnerships in T&E and Acquisition  
12-15 Sep 2011  
Orlando, FL  
POC: ITEA, [symposium@itea.org](mailto:symposium@itea.org)  
[http://itea.org/Annual\\_Symposium.asp](http://itea.org/Annual_Symposium.asp)

26th International Ballistics Symposium & Exhibition  
12-16 Sep 2011  
Miami, FL  
POC: NDIA, Kari King, (703) 247-2588  
[kking@ndia.org](mailto:kking@ndia.org)  
<http://www.ndia.org/meetings/1210/Pages/default.aspx>

2011 MSS Active E-O Systems  
13-15 Sep 2011  
San Diego, CA  
POC: SENSIAC, Matthew Antico, (404) 407-8379  
[matthew.antico@dlpe.gatech.edu](mailto:matthew.antico@dlpe.gatech.edu)  
[https://www.sensiac.org/external/mss/meetings/list\\_meetings.jsf](https://www.sensiac.org/external/mss/meetings/list_meetings.jsf)

Advanced Maui Optical and Space Surveillance Technologies (AMOS) Conference  
13-16 Sep 2011  
Wailea, HI  
POC: MEDB, (808) 875-2318  
<http://www.amostech.com/>

2011 Homeland Security Symposium  
26-27 Sep 2011  
Arlington, VA  
POC: NDIA, Brant Murray, (703) 247-2572  
[bmurray@ndia.org](mailto:bmurray@ndia.org)  
<http://www.ndia.org/meetings/1490/Pages/default.aspx>

2011 Joint Undersea Warfare Technology Fall Conference  
26-29 Sep 2011  
Groton, CT  
POC: NDIA, Kimberly Williams, (703) 247-2578  
[kwilliams@ndia.org](mailto:kwilliams@ndia.org)  
<http://www.ndia.org/meetings/1240/Pages/default.aspx>

AIAA SPACE 2011 Conference & Exposition  
27-29 Sep 2011  
Long Beach, California  
AIAA, (800) 639-2422, [custserv@aiaa.org](mailto:custserv@aiaa.org)

Biometric Consortium Conference and Technology Expo  
27-29 Sep 2011  
Tampa, FL  
POC: J. Spargo,  
e-mail: [biometrics@jspargo.com](mailto:biometrics@jspargo.com)

## OCTOBER 2011

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AUSA Annual Meeting & Exposition  
10-12 Oct 2011  
Washington, DC  
POC: AUSA  
<http://www.ausa.org/meetings/2011/annual/Pages/annual1010-12.aspx>

GEOINT 2011  
16-19 Oct 2011  
San Antonio, TX  
POC: USGIF, <http://www.geoint2011.com>

2011 Combat Vehicles Conference  
24-26 Oct 2011  
Dearborn, MI  
POC: NDIA, Alexis Schwartz, ((703) 247-9463  
[aschwartz@ndia.org](mailto:aschwartz@ndia.org)  
<http://www.ndia.org/meetings/2620/Pages/default.aspx>

49th Annual Targets, UAVs, & Systems Range Operations Symposium & Exhibition  
25-27 Oct 2011  
Fort Walton Beach, FL  
POC: NDIA, Meredith Geary  
(703) 247-9476, [mgeary@ndia.org](mailto:mgeary@ndia.org)  
<http://www.ndia.org/meetings/2410/Pages/default.aspx>

82nd Shock & Vibration Symposium  
30 Oct - 3 Nov 2011  
Baltimore, MD  
POC: SAVIAC, Ashley Shumaker  
(434) 581-3041  
[ashley.shumaker@saviac.org](mailto:ashley.shumaker@saviac.org)  
[http://www.saviac.org/82nd%20Symposium/82nd\\_symposium.htm](http://www.saviac.org/82nd%20Symposium/82nd_symposium.htm)

## NOVEMBER 2011

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Aircraft Survivability Symposium 2011  
1-3 Nov 2011  
San Diego, CA  
POC: NDIA, Brant Murray, (703) 247-2572  
[bmurray@ndia.org](mailto:bmurray@ndia.org)  
<http://www.ndia.org/meetings/2940/Pages/default.aspx>

Aircraft Fire & Explosion Course Vulnerability & Protection In Accidents, Combat & Terrorist Attacks  
8-11 Nov 2011  
Woburn, MA  
POC: BlazeTech, (781) 759-0700  
[firecourse@blazetech.com](mailto:firecourse@blazetech.com)

48th Annual AOC International Symposium and Convention  
13-16 Nov 2011  
Washington, DC  
POC: AOC, Jennifer Bahler,  
(703) 549-1600 x209, [bahler@crows.org](mailto:bahler@crows.org)  
<http://www.crows.org/conventions/48th-annual-aoc-international-symposium-and-convention.html>

14th Annual Directed Energy Symposium  
14-18 Nov 2011  
La Jolla, CA  
DEPS, Donna Storment, (505) 998-4910  
[donna@deps.org](mailto:donna@deps.org)  
<http://www.deps.org/DEPSpages/DESymp11.html>

Interservice/Industry Training, Simulation and Education Conference (IITSEC)  
28 Nov - 1 Dec 2011  
Orlando, FL  
POC: NDIA, Barbara McDaniel  
(703) 247-2569, [bmcdaniel@ndia.org](mailto:bmcdaniel@ndia.org)  
<http://www.iitsec.org/Pages/default.aspx>

## DECEMBER 2011

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Combat Systems Symposium: "Balancing Capability and Capacity"  
12-13 Dec 2011  
Arlington, VA  
POC: Dave Solin, (703) 836-6727  
[dsolin@navalengineers.org](mailto:dsolin@navalengineers.org)  
<http://www.navalengineers.org/events/individualevent-websites/Pages/CombatSystemsSymposium.aspx>

Visit our website for more event listings: <http://iac.dtic.mil/surviac>

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