NDIA
AT THE HEART OF THE MISSION

2021 FUTURE FORCE CAPABILITIES

CONFERENCE & EXHIBITION

Armaments, Robotics, Munitions, and EOD

October 18 – 21 | Columbus, GA | NDIA.org/FutureForce21

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NDIA

WHO WE ARE

The National Defense Industrial Association is the trusted leader in defense and national security associations. As a 501(c)(3) corporate and individual membership association, NDIA engages thoughtful and innovative leaders to exchange ideas, information, and capabilities that lead to the development of the best policies, practices, products, and technologies to ensure the safety and security of our nation. NDIA's membership embodies the full spectrum of corporate, government, academic, and individual stakeholders who form a vigorous, responsive, and collaborative community in support of defense and national security. For more than 100 years, NDIA and its predecessor organizations have been at the heart of the mission by dedicating their time, expertise, and energy to ensuring our warfighters have the best training, equipment, and support. For more information, visit **NDIA.org**

GET INVOLVED
Learn more about NDIA's Divisions and how to join one at **NDIA.org/Divisions**

ARMAMENTS DIVISION

WHO WE ARE

The Armaments Division provides a forum for industry, military, and government personnel to address issues in order to ensure a superior armament system capability today and in the future. The Division addresses armament operational needs and requirements, approaches and concepts, system integration, weapons, munitions, fire control, and logistic support. Attention is given to total systems, technology application, and state-of-the-art advancements in technology.

LEADERSHIP AND COMMITTEES

Brian Berger
Division Chair

Bruce Webb
Division Vice Chair

Steve Faintich
Small Arms Committee Chair

Alan Kull
UEA Committee Chair

Matt Phillips
GARM Committee Chair

GLOBAL EXPLOSIVE ORDNANCE DISPOSAL COMMUNITY

WHO WE ARE

The Explosive Ordnance Disposal (EOD) committee brings together government, international partners, academia, and industry to address the needs of the EOD warfighter, the civilian Public Safety Bomb Squads, and non-governmental organizations. Through our partnership with the EOD Warrior Foundation, we provide a forum to address the most pressing problems of the EOD warfighters and their families.

LEADERSHIP AND COMMITTEES

COL Leo Bradley, USA (Ret)
Chair, EOD Symposium

Eugene Squires
EOD Committee Chair

MUNITIONS TECHNOLOGY DIVISION

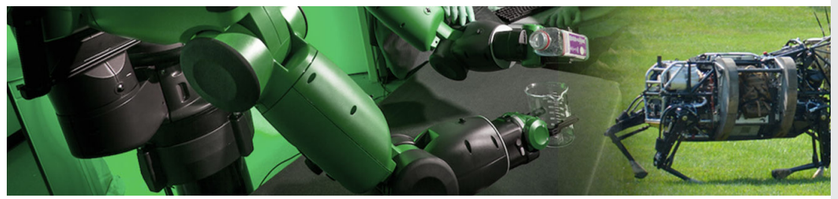
WHO WE ARE

The Munitions Technology Division works to maintain the open exchange of technical information among government and industry programs and technical managers. In addition, the Division identifies changes and trends in policy, guidance, and organizational functions that affect the development, production, maintenance, and demilitarization of munitions. The Division is comprised of two sections, Fuze and Insensitive Munitions & Energetic Materials, and one advisory group, the Industrial Committee of Ammunition Producers.

LEADERSHIP AND COMMITTEES

Nick Perry
Division Chair

COL Moises (MO) Gutierrez, USA (Ret)
Division Vice Chair



ROBOTICS DIVISION

WHO WE ARE

The Robotics Division focuses on security-related robotics technology, covering the development, acquisition, application, integration, and sustainment of unmanned ground systems to improve warfighters' capabilities and survivability. The Division sponsors the Ground Robotics Champion and Ground Robotics Technology Innovator Awards.

LEADERSHIP AND COMMITTEES

Matt Dooley
Division Chair

Howard Kent
Robotic Armament Payload Chairman

EVENT INFORMATION

LOCATION

Columbus Georgia Convention & Trade Center
801 Front Avenue
Columbus, GA 31901

WIFI

Network: FFCCE21
Password: PacSciEMC

REAL-TIME Q&A

Slido is an audience engagement platform that allows users to crowd-source top questions to drive meaningful conversations and increase crowd participation. Participants can up-vote the questions they would most like to hear discussed. Simply tap the thumbs-up button to up-vote a question. Top questions are displayed for the moderator and speaker to answer. Ask your question in sessions by going to Slido!

Event code: FFC2021

ATTIRE

Civilian: Business
Military: Uniform of the Day

SURVEY AND PARTICIPANT LIST

You will receive via email a survey and list of participants (name and organization) after the conference. Please complete the survey to make our event even more successful in the future.

EVENT CONTACTS

Meredith Mangas, CMP
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Program Manager, Divisionsr
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SPEAKER GIFTS

In lieu of speaker gifts, a donation is being made to the Fisher House Foundation.

HARASSMENT STATEMENT

NDIA is committed to providing a professional environment free from physical, psychological and verbal harassment. NDIA will not tolerate harassment of any kind, including but not limited to harassment based on ethnicity, religion, disability, physical appearance, gender, or sexual orientation. This policy applies to all participants and attendees at NDIA conferences, meetings and events. Harassment includes offensive gestures and verbal comments, deliberate intimidation, stalking, following, inappropriate photography and recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome attention. Participants requested to cease harassing behavior are expected to comply immediately, and failure will serve as grounds for revoking access to the NDIA event.

EVENT CODE OF CONDUCT

NDIA's Event Code of Conduct applies to all National Defense Industrial Association (NDIA), National Training & Simulation Association (NTSA), and Women In Defense (WID) meeting-related events, whether in person at public or private facilities, online, or during virtual events. NDIA, NTSA, and WID are committed to providing a productive and welcoming environment for all participants. All participants are expected to abide by this code as well as NDIA's ethical principles and practices. Visit NDIA.org/CodeOfConduct to review the full policy.

AGENDA

MONDAY, OCTOBER 18

11:00 am – 7:00 pm

REGISTRATION
NORTH HALL LOBBY

1:50 – 2:00 pm

CAPABILITIES KICK-OFF
FOUNDRY ROOM

Brian Berger
President and Chief Executive Officer, GTDS America, LLC
Introducer

Donald Sando
Deputy to the Commanding General and Director of Capabilities Development & Integration, U.S. Army Maneuver Center of Excellence

2:00 – 3:00 pm

CONCEPTS DIVISION EMERGING TECHS
FOUNDRY ROOM

Donald Sando
Deputy to the Commanding General and Director of Capabilities Development & Integration, U.S. Army Maneuver Center of Excellence
Moderator

Jim Stone
Acting Director, Concept Development Division, Maneuver Capabilities Development and Integration Directorate

3:05 – 4:05 pm

ACM STRYKER AND EMERGING ARCTIC CONDITIONS
FOUNDRY ROOM

Donald Sando
Deputy to the Commanding General and Director of Capabilities Development & Integration, U.S. Army Maneuver Center of Excellence
Moderator

Dominick Edwards
Deputy Director, Army Capability Manager, Stryker Brigade Combat Team, Maneuver Center of Excellence

4:10 – 5:10 pm

MANEUVER BATTLE LAB/ACM'S
FOUNDRY ROOM

Donald Sando
Deputy to the Commanding General and Director of Capabilities Development & Integration, U.S. Army Maneuver Center of Excellence
Moderator

COL Christopher Budihas, USA
Director, Maneuver Battle Lab, Maneuver Capabilities Development and Integration Directorate

5:10 – 7:00 pm

RECEPTION
NATIONAL INFANTRY MUSEUM – TRANSPORTATION WILL BE PROVIDED

Donald Sando
Deputy to the Commanding General and Director of Capabilities Development & Integration, U.S. Army Maneuver Center of Excellence

TUESDAY, OCTOBER 19

7:00 am – 6:30 pm

REGISTRATION
NORTH HALL LOBBY

7:00 – 8:00 am

NETWORKING BREAKFAST
CENTER HALL

8:00 – 8:15 am

NDIA OPENING REMARKS
IRON WORKS BALLROOM

MG James Boozer, USA (Ret)
Executive Vice President, National Defense Industrial Association (NDIA)

8:20 – 8:35 am

WELCOME REMARKS
IRON WORKS BALLROOM

MG James Boozer, USA (Ret)
Executive Vice President, National Defense Industrial Association (NDIA)
Introducer

MG Patrick Donahoe, USA
Commanding General, U.S. Army Maneuver Center of Excellence

8:40 – 9:20 am

KEYNOTE SPEAKER
IRON WORKS BALLROOM

MG James Boozer, USA (Ret)
Executive Vice President, National Defense Industrial Association (NDIA)
Introducer

Brian Berger
President and Chief Executive Officer, GTDS America, LLC
Moderator

Honorable Ellen Lord
Former Under Secretary of Defense for Acquisition & Sustainment

9:00 am – 6:30 pm

EXHIBIT HALL OPEN
EXHIBIT NORTH AND SOUTH HALLS

9:20 – 10:30 am

NETWORKING BREAK
EXHIBIT NORTH AND SOUTH HALLS

10:30 – 11:00 am

BUDGET BRIEF
IRON WORKS BALLROOM

MG James Boozer, USA (Ret)
Executive Vice President, National Defense Industrial Association (NDIA)
Introducer

Nicholas Perry
Director, Strategy & Strategic Planning, Northrop Grumman Corporation
Moderator

Jay Brannam
Executive Director, Munitions Industrial Base Task Force

11:00 am – 12:30 pm

NETWORKING LUNCH
EXHIBIT NORTH AND SOUTH HALLS

TUESDAY CONCURRENT BREAKOUT SESSIONS

	ROBOTICS SYCAMORE ROOM	SMALL ARMS IRON WORKS BALLROOM AB	GARM ROOM 205	UEA ROOM 211	EOD IRON WORKS BALLROOM C	MES FOUNDRY ROOM B
12:30 – 12:55 pm	**An Army Robotics and Autonomous Systems Update** **Matt Dooley** Chief Executive Officer, Fidelium, LLC *Moderator* **Dr. Bob Sadowski** Senior Robotics Scientist, Research, Technology, & Integration Directorate, Ground Vehicle Systems Center, U.S. Army Combat Capabilities Development Command (DEVCOM) **MAJ Cory Wallace, USA** Robot Combat Vehicle Lead, Next Generation Combat Vehicle Cross-Functional Team **COL Rob Ryan, USA** Director, Robotics Requirements, Maneuver Capabilities Development Integration Directorate, Futures and Concepts Center, U.S. Army Futures Command **Stu Hatfield** Chief, Robotics Branch, HQDA G-8 FDD	**PM Soldier Lethality Panel** **COL Scott Madore, USA** Project Manager, Soldier Lethality, U.S. Army *Moderator* **David Oatley** Product Director, Crew Served Weapons **LTC Peter Stambersky, USA** Product Manager, Individual Weapons, Office of the Product Manager for Individual Weapons	23815 **Integrated Quality Management Reduces Risk for Armament, Robotic, and Munitions Manufacturers** **Mike Miller** Founder and Chief Executive Officer, TIP Technologies	24030 **Prism Demonstration** **Charles Douros** Performance Analysis Branch Chief, Armaments Center, U.S. Army DEVCOM	**DoD EOD Program Board Update** **Brig Gen William Kale III, USAF** Director, Civil Engineer, Deputy Chief of Staff, Logistics, Engineering and Force Protection, U.S. Air Force	**Ammunition Enterprise Cross-Service Update** **BG William Boruff, USA** Joint Program Executive Officer, Armaments & Ammunition *Moderator* **BG Gavin Gardner, USA** Commander, Joint Munitions Command **COL Lance Green, USA** Military Deputy, Armaments Center, U.S. Army DEVCOM
1:00 – 1:25 pm			23931 **MIM Frangible Energetic Projectiles for Medium-Caliber Weapons** **Howard Kent** Chief Executive Officer, Armor Development Group LLC	24041 **Human Autonomy Interactions for Intelligent Weapons Systems** **Andrew Tweedell** Research Kinesiologist, DEVCOM Army Research Laboratory, Human Research and Engineering Directorate	**Army Panel** **Leo Bradley** Founder, L.E. Bradley Consulting, LLC *Moderator* **COL Shawn Kadlec, USA** Director, Explosive Ordnance Disposal, Training & Doctrine Command Integration Office, U.S. Army Combined Arms Support Command **COL Russ Hoff, USA** Project Manager, Close Combat Systems, Joint Program Executive Office for Armaments & Ammunition	
1:30 – 1:55 pm	24083 **All-Domain Execution and Planning (ADEPT) Framework** **Camila Francolin** Leader, Autonomy, Guidance, Navigation, & Control Division, Draper		24017 **Modulation-Assisted Gun-Drilling** **Dr. James Mann** Chief Executive Officer, M4 Sciences LLC	24050 **The Development and Status of the Fire and Ordnance Control for Unmanned Systems (FOCUS)** **Thomas Spirock** Electrical Engineer, Armaments Center, U.S. Army DEVCOM		**PM Acquisition Panel** **Chris Grassano** Deputy Program Executive Officer, Joint Program Executive Office for Armaments & Ammunition *Moderator* **CAPT Brian Schorn, USN** Project Director, Joint Bombs, Joint Program Executive Office for Armaments & Ammunition **COL Russel Hoff, USA** Project Manager, Close Combat Systems, Joint Program Executive Office for Armaments & Ammunition **COL Anthony Gibbs, USA** Project Manager, Combat Ammunition Systems, Joint Program Executive Office for Armaments & Ammunition **COL Paul Alessio, USA** Project Manager, Maneuver Ammunition Systems, Joint Program Executive Office for Armaments & Ammunition **Melissa Markos** Acting Deputy, Project Director, Joint Services, Joint Program Executive Office for Armaments & Ammunition
2:00 – 2:25 pm	24064 **Autonomous Robotic Systems Act as Force Multipliers to Improve Warfighting Safety and Increase Operational Tempo** **Jonathan Brown** Manager, Business Development, RE2 Robotics	24005 **Long-Life Gun Barrel Tests** **George Kontis** Chief Executive Officer, Gun IQ International LLC	24032 **Modernizing the Energetics Manufacturing Industrial Base** **Chris Marlow** Project Manager, Franklin Engineering Group, Inc.	24073 **Range Extension for the Anti-Access Battlefield** **John Martins** Director, International Programs, MBDA, Inc.	24011 **Enabling Explosive Ordnance Disposal Operations in the Electromagnetic Spectrum** **Jerry Coburn** Senior Director, Business Development, Sierra Nevada Corporation **David Barnhard** Director, Business Development, Kutta Technologies, Inc.	
2:25 – 2:55 pm	**NETWORKING BREAK – EXHIBIT HALL** EXHIBIT NORTH AND SOUTH HALLS					

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TUESDAY CONCURRENT BREAKOUT SESSIONS

ROBOTICS — SYCAMORE ROOM

3:00 – 3:25 pm

23987
Considerations for Lethality Packages on Unmanned Ground Vehicle Platforms: Arming a Killer Robot
BG Phillip Coker, USA (Ret)
Chief Executive Officer, EOS Defense Systems USA, Inc.

3:30 – 3:55 pm

23747
Critical Scout – Repurposing Small Ground Robotic Vehicles TP Pinpoint Observers
Dr. Leo Volfson
President, Torrey Pines Logic, Inc.
Howard Kent
Chief Executive Officer, Armor Development Group LLC

4:00 – 4:25 pm

24035
FENRIS: Persistent Autonomous ISR in the Arctic and Beyond
James Crowell
Founder and Chief Executive Officer, Crow Industries

4:30 – 4:55 pm

24070
Gaining Decision-Making Advantage through Force Design and Mission Integration
Timothy Walton
Fellow, Center for Defense Concepts and Technology, Hudson Institute

4:55 – 5:00 pm

CLOSING REMARKS
Matt Dooley
President and Chief Executive Officer, Fidelium, LLC

SMALL ARMS — IRON WORKS BALLROOM AB

3:00 – 3:25 pm

Joint Service Small Arms Synchronization Team (JSSAST) Panel
Gus Funcasta
Chief, Joint Service Small Arms Program Office, Armaments Center, U.S. Army DEVCOM, U.S. Army Futures Command
Moderator
COL Lance Green, USA
Military Deputy, Armaments Center, U.S. Army DEVCOM
COL Rhett Thompson, USA
Director, Soldier Requirements Division, Maneuver Capabilities & Integration Directorate
Billy Epperson
Infantry Weapons and Optics Capabilities Integration Officer, Ground Combat Element Division, Fires & Maneuver, Capabilities Development Directorate, Combat Development and Integration, Headquarters, U.S. Marine Corps
Craig LaMudge
Program Manager, Combat Arms, HQ USAF/A4SF
Jason Rissler
Systems Engineering and Technical Assistance (SETA), Weapons

3:30 – 3:55 pm

Joint Service Small Arms Program (JSSAP) Office Session
Gus Funcasta
Chief, Joint Service Small Arms Program Office, Armaments Center, U.S. Army DEVCOM, U.S. Army Futures Command
Moderator
Mark McFadden
JSSARI Chairman, NATO Dismounted Soldier Systems, Weapons and Sensors Subgroup, U.S. Head of Delegation
Adam Jacob
Program Management Engineer, Joint Small Service Small Arms Program Office, U.S. Army Futures Command
Terence Rice
Armaments Center, Joint Small Service Small Arms Program Office, U.S. Army DEVCOM
Matthew Moeller
Lead, Soldier Lethality Cross-Functional Team, Armaments Center, Joint Service Small Arms Program Office, U.S. Army DEVCOM
Corey Hall
Manager, Joint Small Arms Small Business Innovation Research, Joint Service Small Arms Program Office

4:55 – 5:00 pm

CLOSING REMARKS
Brian Berger
President and Chief Executive Officer, GTDS America, LLC

GARM — ROOM 205

3:00 – 3:25 pm

24034
Data Science & ML-Enabled Terminal Effects Optimization
John Cilli
Computer Scientist, System Analyst, System Analysis Division, Picatinny Arsenal, U.S. Army

3:30 – 3:55 pm

24040
Analytical Evaluation and Redesign of the MK44 Rounds Positioner Spring Using Adam Multibody Dynamics Simulation Software
Jesse Behrens
Senior Principal Systems Engineer, Northrop Grumman Corporation

4:00 – 4:25 pm

24049
Multifunction Sealing, Quality Assurance, and Ammunition Marking Systems
Gustavo Domit
General Manager, Hernon Manufacturing, Inc.

4:30 – 4:55 pm

24009
Shaping the Future of Indirect Fires
Tiffany Winzell
Executive Director, Business Development, Elbit Systems of America

4:55 – 5:00 pm

CLOSING REMARKS
Matthew Phillips
Director, Business Development, General Dynamics Ordnance and Tactical Systems

UEA — ROOM 211

3:00 – 3:25 pm

23999
Modernizing the Army by Utilizing Design of Experiments Approaches to Determine System Effectiveness in a Stochastic Infantry Simulation
Thorsten Roberts
Military Operations Researcher, Armaments Center, U.S. Army DEVCOM

3:30 – 3:55 pm

24025
Decision Analytics for Threat Response
Charles Douros
Performance Analysis Branch Chief, Armaments Center, U.S. Army DEVCOM

4:00 – 4:25 pm

CLOSING REMARKS
Alan Kull
Senior Manager, Aerospace Systems Engineering, General Atomics

EOD — IRON WORKS BALLROOM C

3:00 – 3:25 pm

24007
Enhanced Situational Awareness for the Modern EOD Warrior
Dr. Aris Makris
Vice President, Research & Development, and Chief Technology Officer, Med-Eng

3:30 – 3:55 pm

24023
Searchable Ordnance Database
Anthony O'Shaughnassey
Chief Executive Officer and Managing Partner, FMF Technology, LLC
Mike Pate
Chief Operating Officer, FMF Technology, LLC
Vadim Bichutskiy
Chief Technology Officer, FMF Technology, LLC

4:00 – 4:25 pm

CLOSING REMARKS
Leo Bradley
Founder, L.E. Bradley Consulting, LLC

MES — FOUNDRY ROOM B

3:00 – 3:25 pm

PM Acquisition Panel Continued

3:30 – 3:55 pm

Energetics and Lethality: The Imperative to Reshape the U.S. Military Kill Chain
Dr. Theresa Mayer
Executive Vice President, Research & Partnerships, Purdue University
Moderator
Dr. Thomas Russell
Former Deputy Assistant Secretary of the Army for Research & Technology
James Thomsen
Former Principal Deputy Assistant Secretary of the Navy (Research, Development and Acquisition)
MG Bill Hix, USA (Ret)
Former Chief, Strategy Office, U.S. Army
Dr. Robert Wardle
Principal, Wardle Enterprises, Energetic Solutions and Technologies, Inc.

4:30 – 4:55 pm

CLOSING REMARKS
Nicholas Perry
Director, Strategy & Strategic Planning, Northrop Grumman Corporation

5:00 – 6:30 pm

NETWORKING RECEPTION
EXHIBIT NORTH AND SOUTH HALLS

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WEDNESDAY, OCTOBER 20

7:00 am – 5:00 pm

REGISTRATION
NORTH HALL LOBBY

7:00 – 8:00 am

NETWORKING BREAKFAST
CENTER HALL

8:00 – 8:15 am

OPENING REMARKS
IRON WORKS BALLROOM

MG James Boozer, USA (Ret)
Executive Vice President, National Defense Industrial Association (NDIA)
Introducer

B. H. "Skip" Henderson, III
Mayor of Columbus, Georgia

8:20 – 9:05 am

KEYNOTE SPEAKER
IRON WORKS BALLROOM

MG James Boozer, USA (Ret)
Executive Vice President, National Defense Industrial Association (NDIA)
Introducer

Brian Berger
President and Chief Executive Officer, GTDS America, LLC
Moderator

COL Wendell Leimbach, Jr., USA
Director, Joint Intermediate Force Capabilities Office, U.S. Department of Defense

9:00 – 3:00 pm

EXHIBIT HALL OPEN
EXHIBIT NORTH AND SOUTH HALLS

9:10 – 9:40 am

NETWORKING BREAK
EXHIBIT NORTH AND SOUTH HALLS

9:40 – 10:25 am

FOREIGN COMPARATIVE TESTING (FCT) PROGRAM OVERVIEW
IRON WORKS BALLROOM

MG James Boozer, USA (Ret)
Executive Vice President, National Defense Industrial Association (NDIA)
Introducer

COL Randy Everett, USA (Ret)
International Armaments Cooperation Staff Officer, U.S. Army Combat Capabilities Development Command

10:30 – 11:30 am

AWARDS PRESENTATION
IRON WORKS BALLROOM

Small Arms Committee Chinn Award
Ralph Mazeski

Small Arms Committee Hathcock Award
MSGT Kevin Owens, USA

Small Arms Committee James R. Ambrose Award
Vista Outdoor

Gun & Missile Systems Committee Robert Trifiletti Award
Ralph Campoli

Defense User Recognition for Excellence Award
Dan Deguire

Ground Robotics Champion
MAJ Cory Wallace, USA

Armaments Division Professional Service Award
COL Hector Gonzales, USA

Armaments Division Professional Service Award
COL Andrew Lunoff, USA

11:30 – 1:00 pm

NETWORKING LUNCH
EXHIBIT NORTH AND SOUTH HALLS

WEDNESDAY CONCURRENT BREAKOUT SESSIONS

	ROBOTICS SYCAMORE ROOM	SMALL ARMS IRON WORKS BALLROOM AB	GARM ROOM 205	UEA ROOM 211	EOD IRON WORKS BALLROOM C	MES FOUNDRY ROOM B
1:00 – 1:25 pm	24039 **Hardware-Enforced Data Separation Security on Autonomous Robotic Systems or: How I Learned to Stop Worrying and Trust the Robot** Matthew Dosmann Vice President, Strategy, InZero Technologies	**Suppressor Panel/Session** Adam Jacob Program Management Engineer, Joint Service Small Arms Program Office, U.S. Army Futures Command *Moderator* 24068 **STANREC 4785 Suppressor Testing** Dr. Leslie James Flemming Project Lead, Small Arms Signature Laboratory, Naval Surface Warfare Center – Crane Division Adam Jacob Program Management Engineer, Joint Service Small Arms Program Office, U.S. Army Futures Command 23988 **Modular Suppressor Test Bed Design of Experiments** Daniel Cler General Engineer, Armaments Center, U.S. Army DEVCOM 23964 **Suppressor Cleaning** Zachary Torigian Mechanical Engineer, Armaments Center, U.S. Army DEVCOM 24054 **Intermediate Caliber Virtual-Baffle Suppressor System** Dr. Phillip Burnside Mechanical Engineer, Naval Surface Warfare Center – Crane Division 23979 **Surefire's Advanced Suppressor Program - Blending Experience with Technology to Bring Next Generation Signature Suppression Technology to the Warfighter** Barry Dueck Vice President, Suppressor & Weapons Division, Surefire 24052 **7.62mm Belt-Fed Suppressor** Phillip Haag Director, Research & Development, Radical Firearms/Radical Defense 24061 **Maxim Defense M240 Suppressor** David Steinbech Director, Military & Law Enforcement Sales, Maxim Defense, Inc.	24008 **Modular Multi-Mode Seeker** Greg Newman Technical Director, Engineering, Elbit Systems of America	**Passive IR Projectile Tracking for RWS Closed-Loop Fire Control** Matt Robertson Weapons Systems, Naval Surface Warfare Center – Crane Division	**USAF Panel** Leo Bradley Founder, L.E. Bradley Consulting, LLC *Moderator* Dr. John Olive Deputy, EOD Division, Air Force EOD Subject Matter Expert SMSgt Cole Pasley, USAF Manager, Joint EOD Technology Division	**Industry Panel: Medium and Small Businesses** Scott McAnallen Program Manager, Azimuth Consulting *Moderator* David Siggers President, Spectra Technologies LLC Scott Selle President, Armtec Defense Technologies Nick Korinis President and Chief Executive Officer, SAVIT Corporation
1:30 – 1:55 pm	24004 **Mobile Minefield: How to Kill Modern Tanks That Have Advanced Protection with Small Robots** Dewey Akers Vice President, Sales, Spartan Armor Systems		24036 **MK52 Chain Gun (7.62 X 62mm) History, Capabilities, Reliability, and Platform Integration** Art O'Donnell Lead, Engineering, Northrop Grumman Defense Systems	23729 **Hydrone Multi-Domain (Marine, Ground, Air) Vehicle** Scott Kempshall President and Chief Executive Officer, HyALTA Aeronautics, Inc.		
2:00 – 2:25 pm	24058 **The Multi-Purpose Expeditionary Platform** Caleb Holt Chief Executive Officer, Tracks North America, LLC		24063 **Counter-Improvised Explosive Devises (CIED)** Dr. Benjamin Barrowes Senior Research Electrical Engineer, Cold Regions Research & Engineering Laboratory, U.S. Army Corps of Engineers	24006 **Armament Sustainment and Lethality Multipliers in Expeditionary Settings** Jonathan Ross Manager, Strategic Initiatives, Marvin Engineering Co., Inc. Todd McKinney Director, Technical Solutions, Marvin Engineering Comany, Inc.	24081 **The EOD Future Threat Landscape and Explosive Detection Technology Advancements** Sean Dennis President, United States Bombs Tech Association	**CLOSING REMARKS** Nicholas Perry Director, Strategy & Strategic Planning, Northrop Grumman Corporation
2:25 – 2:55 pm	**NETWORKING BREAK** EXHIBIT NORTH AND SOUTH HALLS					

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WEDNESDAY CONCURRENT BREAKOUT SESSIONS

	ROBOTICS SYCAMORE ROOM	SMALL ARMS IRON WORKS BALLROOM AB	GARM ROOM 205	UEA ROOM 211	EOD IRON WORKS BALLROOM C	MES FOUNDRY ROOM B
3:00 – 3:25 pm	24019 **AI-Enabled and UAS-Supported Terrain-Traversability Assessment for Off-Road Navigation of Robotic and Autonomous Systems (RAS)** Dr. Yoichiro Endo Director, Robotics & Electromechanical Systems, Intelligent Automation, Inc.	24028 **Artificial Intelligence-Enabled Small Arms for Networked Lethality** Ross Towers Lead, Future Fire Control Team, Small Arms, Armaments Center, U.S. Army DEVCOM	**USMC – APBI** Capt Howard Mill, USMC Chief Information Officer, Counter-UAS, Aviation Combat Element Division, Combat Development and Integration	24060 **TRAPS: Empowering FWS-I and Storm Systems** Leif Horton Vice President, Sales, TX-Tactical	24074 **Briefing on EOD Issues with Disposing of Insensitive Munitions** Willie Snell Specialist, Explosive Ordnance Disposal Equipment, U.S. Army EOD Technical Detachment	
3:30 – 3:55 pm	24079 **Emerging Technologies for Armed Unmanned Systems** Gus Taylor Chief Engineer, Weapons Systems, Naval Surface Warfare Center – Crane Division Ernesto Garcia-Lopez Special Programs Manager, Strategic Relationships Division, Business Interface Office, Enterprise & Systems Integration Center, Armaments Center, U.S. Army DEVCOM Michael Jones Lead Engineer, Scalable Effects R&D Group, Naval Surface Warfare Center – Crane Division	24029 **Semi-Autonomous Engagement Mechanisms and Effects for Small Arms** Ross Towers Lead, Future Fire Control Team, Small Arms, Armaments Center, U.S. Army DEVCOM	24045 **Xm914e2 Chain Gun – LW30 (30mm X 113mm) Capability on Light Tactical Vehicles** John Inman System Engineer, Northrop Grumman Corporation	24056 **Reinforced Concrete Wall Performance Prediction Using Deep Neural Network** David Holgado Senior Safety & Security Engineer, Stone Security Engineering	**CLOSING REMARKS** Leo Bradley Founder, L.E. Bradley Consulting, LLC	
4:00 – 4:25 pm	24038 **Optionally Manned Semi-Autonomous Howitzer** Michael Evans Program Manager, Fires Programs, AM General LLC	24048 **Mechanochemically Assisted Broaching of Refractory-Lined Gun Barrels** Dr. Jason Davis Mechanical Engineer, Naval Surface Warfare Center – Crane Division	**CLOSING REMARKS** Matthew Phillips Director, Business Development, General Dynamics Ordnance and Tactical Systems	24046 **Virtual Gunner** William Nuckols Program Director, Ground Combat Systems, Elbit Systems of America		
4:30 – 4:55 pm	24014 **Perception-Based Robotic Reconnaissance Team Coordination in a Hostile Environment** Dr. Hambisa Keno Principal Scientist, FAST Labs, BAE Systems, Inc.	**CLOSING REMARKS** Brian Berger President and Chief Executive Officer, GTDS America, LLC		24086 **Capability Integration: Considering for Delivering the Future** Tom Henthorn Capability Developer, USG CTR, Joint Service Small Arms Program		
4:55 – 5:00 pm	**CLOSING REMARKS** Matt Dooley President and Chief Executive Officer, Fidelium, LLC			**CLOSING REMARKS** Alan Kull Senior Manager, Aerospace Systems Engineering, General Atomics		

THURSDAY, OCTOBER 21

8:30 am — **TRANSPORTATION PICK-UP**
COLUMBUS, GA, CONVENTION AND TRADE CENTER

9:00 am — **ARMOR RESTORATION SHOP**
HARMONY CHURCH

11:00 am — **TRANSPORT TO SMALL ARMS LIVE-FIRE DEMONSTRATION**
PATTON RANGE

12:30 – 4:00 pm — **LIVE-FIRE DEMONSTRATION**
PATTON RANGE

2:00 pm — **EARLY BUS DEPARTS**
PATTON RANGE

LIVE-FIRE DEMONSTRATING COMPANIES

THURSDAY, OCTOBER 21

AERO PRECISION
AIMLOCK
B&T USA
KGM TECHNOLOGIES
LEIDOS INNOVATIONS CENTER
LMT DEFENSE
MARATHON TARGETS
MAXIM DEFENSE INDUSTRIES
NOVO USA
RADICAL DEFENSE
SECUBIT, INC. | WEAPONLOGIC
SIG SAUER, INC.
SUREFIRE, LLC
TRIJICON
UNIT SOLUTIONS

ABSTRACT SUMMARIES

ROBOTICS

24083

All-Domain Execution and Planning (ADEPT) Framework

Francolin, C.

The ADEPT framework is a design concept which addresses the challenges of adaptive behaviors and intelligent autonomy. ADEPT has had multiple instantiations in software architectures used on a wide variety of autonomous systems and applications including undersea, ground, air, and space vehicles.a

24064

Autonomous Robotic Systems Act as Force Multipliers to Improve Warfighting Safety and Increase Operational Tempo

Brown, J.

RE2 Robotics is developing multiple autonomous robotic systems for the DoD to serve as force multipliers, help decrease injuries experienced by warfighters, and increase operational tempo.

23987

Considering for Lethality Packages on Unmanned Ground Vehicle Platforms: Arming a Killer Robot

Coker, P.

To achieve maximum effectiveness, lethality payloads on UGV platforms must be precise, sufficiently powerful, reliable, easily resupplied, modular and intelligent.

23747

Critical Scout - Repurposing Small Ground Robotic Vehicles TP Pinpoint Observers

Kent, H.

A robotic payload that geolocates enemy optics.

24035

Fenris: Persistent Autonomous ISR in the Arctic and Beyond

Crowell, J.

Fenris is a small-scale ruggedized, intelligent unmanned ground vehicle (UGV) designed to provide persistent ISR in the Arctic and beyond. In this talk, CI's Founder & CEO James Crowell will discuss Fenris' current progress to date and its promise for the future.

24070

Gaining Decision-Making Advantage Through Force Design and Mission Integration

Walton, T.

This DARPA-sponsored study describes a new model for joint force design and integration, where elements of military capability are able to be composed and tailored by Combatant Commanders to the needs of specific operational challenges close to the time of use. Combined with appropriate command and control processes and systems, this model of mission integration has the potential to provide military advantage against capable adversaries through the surprise generated from force composition and recombination. Mission integration could also reduce the cost of operations and modernization by enabling aggregation of less-expensive weapons systems to realize capabilities provided today by large multimission platforms or formations.

24039

Hardware Enforced Data Seperation Security on Autonomous Robotic Systems Or: How I Learned to Stop Worrying and Trust the Robot

Dosmann, M.

As robots become more prevalent and powerful, their cybersecurity is crucial. Hardware enforced data separation closes critical gaps in their security.

24004

Mobile Minefield: How to Kill Modern Tanks That Have Advanced Protection with Small Robots

Akers, D.

They may have passive and active protection from direct fire, artillery fragment, rocket and missile threats, but even the latest battle tanks are vulnerable to the smallest robotic systems. Proposed are commercially developed scale off road racing vehicles used to create weapons which are armored, armed and equipped with surveillance systems to destroy armored vehicles and other targets.

24058

The Multi-Purpose Expeditionary Platform

Holt, C.

The Multi-Purpose Expeditionary Platform (MPEP) provides the Air Force an innovative, versatile platform for logistics, construction, disaster recovery, and more, along with multiple hydraulic attachment available today.

24019

AI-Enabled and UAS-Supported Terrain-Traverability Assessment for Off-Road Navigation of Robotic and Autonomous Systems (RAS)

Endo, Y.

A computational framework for a RAS that enables real-time construction of a traversability map was developed. Employing a set of customized deep neural networks, the traversability of the region perceivable through an onboard camera and/or a UAS-captured aerial image is automatically inferred and added to an active traversability map, so that the most efficient route can be computed. This computational framework was implemented within ROS-2, and integrated into a custom-made autonomy payload. The successful field-testing using this UGV-mounted autonomy payload paired with a sUAS demonstrated the utility of this AI-enabled computational framework for effective off-road navigation of future RAS.

24079

Emerging Technologies for Armed Unmanned Systems

Garcia-Lopez | E. Taylor, G.

Group (JTUAWG). The working group is a network of Army and Navy Laboratories that collaborate to develop small/miniature weapons for smaller Unmanned Systems in the land, air, and sea domains. This multi-domain capability will ultimately save friendly lives by giving small combat units the ability to conduct armed reconnaissance, and optionally engage the enemy with scalable effects, and without exposing Warfighters to enemy fire.

24038

Optionally Manned Semi-Autonomous Howitzer

Evans, M.

AM General with its partners Maren-go and Mandus Group LLC has developed a teleoperated Hawkeye mobile howitzer to demonstrate the feasibility of moving and positioning a 105mm howitzer using a remote device controlled by a distant operator. After a successful test, AM General expanded the capability to leader-follower of two howitzers, autonomous positioning and remote firing of the cannon.

24014

Perception-Based Robotic Reconnaissance Team Coordination in a Hostile Environment

Keno, H.

Our team at BAE Systems FAST Labs is working toward developing and transitioning Mission Intelligence for Tactical Systems (MITS), an autonomy and coordination system for a multi-robot reconnaissance team composed of unmanned ground vehicles (UGVs) and supporting unmanned aerial systems (UASs) that host a variety of sensor payloads. We will present the main challenges we addressed, our method, experimental results, plans for future work, and a transition plan to ground operations.

SMALL ARMS

24005

Long Life Barrel Tests

Kontis, G.

Test results show a major extension in gun barrel life is achievable with barrels made from new steel.

24068

STANREC 4785 Suppressor Testing

Dye, D. | Jacob, A.

An overview of the suppressor testing program at NSWC Crane will be presented including descriptions of test standards, procedures, and hardware used.

23964

Suppressor Cleaning

Torigian, Z.

The purpose of this brief is to present the challenges, trends, methodology and preliminary data from the US Army Suppressor Cleaning effort to the defense community. The presentation will illustrate the widespread problem of small arm suppressors becoming ineffective due a buildup of fouling deposits. The brief will contain technical content related to ongoing developments by both the USG and industry to extend the service life and performance of suppressors.

24054

Intermediate Caliber Virtual-Baffle Suppressor System

Burnside, P.

Using CFD to take advantage of shock waves to improve suppressor performance.

23979

Surefire's Advanced Suppressor Program - Blending Experience with Technology to the Warfighter

Dueck, B.

Surefire's Advanced Suppressor Program blends experience with Technology to bring Next Generation Signature Suppression to the Warfighter. The end results are a Next Generation, patent pending, low back pressure suppressor designed and optimized for the warfighter providing best in class, Audible and Visual characteristics.

24052

7.62 MM Belt Fed Suppressor

Haag, P.

Radical Firearms has produced fully functioning machine gun suppressors with audible, thermal, and flash signature reduction utilizing additive manufacturing from a high nickel and cobalt superalloy. This is to show the real-world viability of the proposed technologies on a proven platform. The technology has the ability to be adapted to multiple platforms.

24061

Maxim Defense M240 Suppressor

Steinbech, D.

This abstract provides the details on Maxim Defenses efforts to reduce/remove the visual and audible signature of the M240MG.

23988

Modular Suppressor Test Bed Design of Experiments

Cler, D.

A design of experiments was conducted using modular suppressor hardware to assess blast and flash.

24028

Artificial Intelligence Enabled Small Arms for Networked Lethality

Towers, R.

As availability of information on the battlefield increases, dismounted forces need tools to filter that information for relevancy, and convert it for immediate action. An artificial intelligence, embedded at the weapon system's fire control, maximizes the utilization of available information to increase dismounted squad lethality.

24029

Semi-Autonomous Engagement Mechanisms and Effects for Small Arms

Towers, R.

Lethality in small arms systems remains limited by Soldier accuracy. Leveraging advances in target detection and tracking enables a semi-autonomous fire control system to significantly reduce aim error, while allowing the Soldier to retain final control over target engagement.

24048

Mechanochemically Assisted Broaching of Refractory-Lined Gun Barrels

Davis, J.

A recent scientific discovery may be key to realizing the use of refractory linings in gun barrels. This discovered surface effect transitions the 'gummy' behavior of refractory metals when cut to one that is much more favorable, enabling conventional rifling of the liners - a task until now that has proven to be quite challenging.

GARM

23815

Integrated Quality Management Reduces Risk for Armaments, Robotic, and Munitions Manufacturers

Miller, M.

This presentation will discuss how an integrated electronic quality management solution can help armament, robotics, and munitions manufacturers improve operations, reduce risk, and meet industry regulations. We will discuss steps to achieving a comprehensive continuous improvement strategy to put companies on the path to improved productivity and profitability, while protecting customer safety.

23931

MIM Frangible Energetic Projecticles for Medium Caliber Weapons

Kent, H.

Introducing a medium caliber frangible energetic projectile for C-UAS, target marking and training.

24017

Modulation-Assisted Gun-Drilling

Mann, J.

Manufacturing productivity gains and quality improvements in deep-hole gun-drilling with modulation are reviewed. Applications in 4140 and 416R steel alloys are discussed.

24032

Modernizing the Energetics Manufacturing Industrial Base

Marlow, C.

A process to evaluate and modernize energetics manufacturing processes is described and detailed, including examples of successful projects.

24034

Data Science & ML-Enabled Terminal Effects Optimization

Eng, K. | Krogstad, Z. | Patel, R.

Warhead design and performance optimization is conducted utilizing technologies from data science, machine learning, distributed computing, and computational optimization.

24040

Analytical Evaluation and Redesign of the MK44 Rounds Positioner Spring Using Adam Multibody Dynamics Simulation Software

Behrens, J.

The Mk44 30mm cannon utilizes a custom shape spring to quickly translate rounds from its dual feed paths and into the bolt. The dynamic behavior of the spring when feeding rounds is difficult to characterize with classical analytically approaches. Optimization of the spring geometry using empirical methods may require multiple time consuming iterations. This presentation will describe how MSC Adams, a multi-body dynamics simulation software, was coupled with SmartUQ's DOE software was utilized to model the Mk44 feed system including gear train, linked rounds, and spring to optimize the Mk44 cannon's rounds positioner spring.

24049

Multifunction Sealing, Quality Assurance and Ammunition Marking Systems

Domit, G.

HERNON Manufacturing has developed a single enclosure which seals, weighs, performs 2-D dimensional profiling and bullet tip ID marking on 100% of post production ammunition passed through it.

24008

Modular Multi-Mode Seeker (Distro D)

Newman, G.

This presentation provides information on Elbit America's integrated seeker suite that address the multi-faceted problem of keeping pace with evolving threats and kill-chain closure in contested regions. This suite of integrated multi-mode sensors and effectors, on distributed platforms and across domains in a networked, configurable battlespace offers an affordable, flexible, WOSA compliant solution.

24009

Shaping the Future of Indirect Fires (Distro D)

Winzell, T.

This presentation provides an overview of the production-ready systems Elbit America offers to the warfighter. Leveraging combat proven systems developed and fielded by Elbit Land in Israel, the ATMOS (mobile howitzer), Sling and Spear (mobile mortars) and Cardom (turreted mortar) systems coupled with precision guided rounds and seeker technologies are re-shaping the future indirect fires. Bringing in laser and GPS guidance gives battlefield operators the ability to connect on target with the first round, providing increased survivability and inherent cost savings. Committed to expanding the U.S. Industrial Base footprint, Elbit America is moving toward U.S. production of these systems beginning in 2022.

24036

MK52 Chain Gun (7.62 X 62MM) History, Capabilities, Reliability, and Platform Integration (Distro D)

O'Donnell, A.

In response to the growing interest in small and medium caliber chain guns on various platforms including Remote Weapon Stations, this presentation will focus on the 7.62 x 51mm MK52 Gun System.

24063

Counter Improvised Explosive Devices (CIED) (Distro D)

Barrowes, B.

High-frequency electromagnetic induction (HFEMI) can detect and classify carbon rods, wires, and other improvised explosive device constituent parts.

24045

XM914E2 Chain Gun - LW30 (30MM X 113MM) Capability on Light Tactical Vehicles (Distro A)

Inman, J.

In response to the growing interest of medium caliber capability on lightweight platforms with focus in counter-UAS, DEVCOM and Northrop Grumman are in the process of maturing and optimizing the 30mm x 113mm XM914E2 Chain Gun. The focus of this abstract highlights the operator level maintainability improvements being implemented into the XM914E2.

UEA

24030

PRISM Demonstration

Douros, C.

Demonstration on the modularity of M&S using DEVCOM AC's PRISM framework.

24041

Human Autonomy Interactions for Intelligent Weapons Systems

Tweedell, A.

New research approaches by U.S. Army Research Laboratory are discussed for human-agent interaction for intelligent squad weapons.

24021

Winning the Gray Zone: The Importance of Intermediate Force Capabilities

Leimbach, W.

Winning in the Gray Zone means completing the "deterrence equation," that is, precluding adversary aggression in competition below armed conflict with intermediate force capabilities (IFCs) in a manner similar to equipping the U.S. military element of national power with overwhelming lethality as a deterrent to armed conflict.

IFCs, which include non-lethal weapons as well as other non-lethal tools, will bridge the gap that exists between a mission of mere presence and the use of lethal effects.

24050

The Developemnt and Status of the Fire and Ordnance Control for Unmanned Systems (Focus)

Spirock, T.

The development of the Fire and Ordinance Control for Unmanned Systems (FOCUS) by the Joint Tactical Unmanned Armaments Working Group (JTUAWG) will be discussed.

24073

Range Extension for the Anti-Access Battlefield

Martins, J.

The INDOPACOM theater requires U.S. forces to employ weapons with increasingly longer standoff ranges. This presentation will discuss the spectrum of modifications to significantly increase weapon employment ranges while preserving weapon mass properties. Specifically, it will discuss the long range ramjet powered Meteor air-to-air weapon, the turbojet powered SPEAR 3 air-to-surface weapon, and wing kit additions to unpowered munitions like the 155mm surface-to-surface guided artillery projectile. Discussions will include weapon kinematics as well as emerging seeker and data link requirements for long range employment on a network connected battlefield.

23999

Modernizing the Army by Utilizing Design of Experiments Approaches to Determine System Effectiveness in a Stochastic Infantry Simulation

Roberts, T.

This case study follows the novel design and analysis of computer experiments (DACE) approach taken for the operational analysis of the AFCT (Advanced Fire Control Technology) as a follow on project for the IVAS (Integrated Visual Augmentation System) for the dismounted combat infantry soldier.

24025

Decision Analytics for Threat Response

Sassaman, G.

Utilizing decision analytics methodologies to respond to threat advancements in technologies and capabilities while balancing system level competing objectives (Cost, Schedule, Performance).

23729

Hydrone Multi-Domain (Marine, Ground, Air) Vehicle

Kempshall, S.

HyDrone is the world's only fully multi-modal (air/land/maritime) UAS. This capability is provided with minimal parasitic elements.

24006

Armament Sustainment and Lethality Multipliers in Expeditionary Settings

McKinney, T. | Ross, J.

The presentation focuses on providing warfighters with the means to integrate and sustain armament systems to support various munitions, including air and surface launched missiles, as well as air dropped bombs, on both manned and unmanned platforms in austere, expeditionary settings. Utilizing mobile, partially containerized solutions, we will discuss how Air, Ground, and Maritime assets can benefit from having agile support capabilities delivered closer to the action, in highly mobile formats that can serve as force multipliers to support distributed operations.

24060

TRAPS: Empowering FWS-I and Storm Systems

Horton, L.

The military has implemented a standard rail interface systems, known as the Picatinny Smart Rail (PSR). This system provides a mounting platform for firearms accessories, including tactical lights or telescopic sights. The military can mount both the Family of Weapon Sights – Individual (FWS-I) (2) and Small Tactical Optical Rifle Mounted (STROM) (3,4,5) micro-laser rangefinder Program of Record hardware onto the current PSR. However, each solution has its own battery source and user interface, complicating decision-making and hindering operational efficiencies for the modern warfighter.

To solve this issue, new approaches are needed to integrate current FWS-I and STORM hardware to the standard PSR. Specifically, the adapters are required for current FWS-I and STORM systems to make these two systems compatible with its new PSR interface, operating system, and electrical supply source to minimize size and weight. The Tactical Rail Accessory Power System (TRAPS) by Axle Box Innovations, will solve these problems and provide the military with a unique solution for integrating FWS-I and STORM hardware onto the Pic rail while delivering a significant cost advantage. The TRAPS is a single-point power supply for electronic targeting enablers.

24056

Reinforced Concrete Wall Performance Predicted Using Deep Neural Network

Holgado, D.

Based on test data, two DNN Models are built to predict rc wall performance under contact and near-contact explosions. Obtained predictions shows higher accuracy compared with currently available models.

24046

Virtual Gunner

Nuckols, W.

Virtual Gunner reduces the cognitive load and enhances the combat effectiveness of a modern combat vehicle crew with multiple sensor and weapon systems employed in the current and future highly dynamic combat environment.

24086

Capability Integration: Considering for Delivering the Future

Henthorn, T.

Everyone seeks to add capability to the squads of the future, but as we try and expand the envelope of capability, we may need to reconsider what that squad looks like…what needs to be considered? How do we get there? What could it look like?

EOD

24011

Enabling Explosive Ordnance Disposal Operations in the Electromagnetic Spectrum

Barnhard, D. | Coburn, J.

Concepts for multi-domain combined arms operations define threats in the operating environment (OE) in 2025 and beyond as super-empowered through rapid access to information and significant advances in commercial electronics. Electronic support hardware and visualization tools that provide detection, localization and isolation of commercial wireless signals and devices will become necessary to enhance security and situational awareness to mitigate risk. The ability to quickly and safely locate SOIs can also be enhanced by the use of multiple, heterogeneous types of unmanned platforms (UGV, UAV, USV, etc.). This presentation will explore notional use cases that illustrate current and envision future technologies that serve to provide the EOD operator with additional sensing capabilities.

24007

Enhanced Situational Awareness for the Modern EOD Warrior

Makris, A.

There is an ever-increasing need to enhance the situational awareness of the modern EOD operator as threats expand and improvised explosive devices (IEDs) become increasingly sophisticated, with possible contamination of the target environment by CBRN agents. Additionally, there can be a need for night operations where visible lights are not permitted. To respond to such threats, EOD operators require equipment and detectors across a broad spectrum of threats, as well as a range of camera sensors, which must seamlessly integrate with their current protective ensembles through appropriate interfaces, displays and embedded heads-up-display (HUD). The current presentation introduces two current programs aimed at delivering integrated sensor and HUD capability to EOD operators, having the potential to significantly transform render safe operations and capability under a diversity of operating conditions and threats.

24023

Searchable Ordnance Database

Bichutskiy, V. | Shaughnassey, A. | Pate, M.

We present Searchable Ordnance Database (SOrD), a novel framework for ordnance and explosives identification, recognition and intelligence. SOrD provides a mobile-first platform---buttressed by a munitions and explosives data lake and an ordnance data warehouse with more than 100,000 items, and leveraging the latest advancements in AI/ML, AR/VR, LIDAR, and mobile technologies---consisting of a suite of tools that provide EOD personnel with actionable intelligence quickly, easily and efficiently.

24074

Briefing on EOD Issues with Disposing of Insensitive Munitions

Snell, W.

This brief covers a short history of munitions safety. It also covers insensitive munitions (IM) and EOD issues with disposing of IM. The reasons we have issues disposing of IM are discussed as are the ways we are currently achieving disposals.

24081

The EOD Future threat Landscape and Explosive Detection Technology Advancements

Dennis, S.

Analysis and solutions for future EOD explosive threat detection requirements with the USBTA and DetectaChem.

POSTER PRESENTERS

SMALL ARMS

Board 1

Coaxial OD Sensors - Enabling Crew Served Weapon Gunners to Eliminate Snipers and Other Optically Equipped Observers

Kent, H.
Armor Development Group, LLC

Board 2

Integration of Modern Suppression Technologies into Mass Production

Mudgett, C.
B&T USA

Board 3

Resiliency of Caliber .50 Projectiles in Barrels with Irregular Rifling

Gmyrek, T.
U.S. Department of Defense

Board 4

Inert Fill Replacement

Bell, J.
UDC USA, Inc.

Board 5

Replacing Tracers With Visible, Thermal and IR Signature on Target Projectile Technology

Kent, H.
Armor Development Group, LLC

Board 6

Modular Suppressor Test Bed Design of Experiments

Cler, D.
Armaments Center, U.S. Army DEVCOM

Board 7

Zinc Slug Feasibility

Holland, T.
Armaments Center, U.S. Army DEVCOM

Board 8

Lightweight Materials Houstings for GRIN Prototype Riflescopes

Dionisio, R.
CCDC Armaments Center, U.S. Army

Board 9

Cleaning Sealed Firearm Suppressors for Longer Service Life and Replacement Cost Savings

France, B.
TDA Research, Inc.

ROBOTICS

Board 10

Kinesis - Universal Robotic Control

Brodmerkel, C.
Tomahawk Robotics

Board 11

What's Your Backup Plan? Adapting Crew Served Robotic Weapons to Manual Firing

Kent, H.
Armor Development Group, LLC

Board 12

Combat Optimized Ballistic Remote Armament (COBRA)

Smith, A.
Armaments Center, U.S. Army DEVCOM

EOD

Board 13

Advanced Demolition Explosives are Needed to Dispose of Insensitive Munitions (IM) to Overcome the Tactical Disadvantage of Current Demolition Explosives

Wittkamper, B.
Booz Allen Hamilton

SPEAKER BIOGRAPHIES

BG WILLIAM BORUFF, USA

Joint Program Executive Officer
Armaments & Ammunition Commanding General

Brigadier General William M. Boruff became the Joint Program Executive Officer Armaments & Ammunition and the Commanding General, Picatinny Arsenal on July 23, 2021, leading the mission to develop and procure conventional and leap-ahead munitions to increase the warfighter's combat power. Prior to this, BG Boruff served as the Special Assistant to the Military Deputy/Director, Army Acquisition Corps, Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology) Washington, DC. Prior to arriving at the Pentagon, Brigadier General Boruff served as the Deputy Commanding General of the Combined Security Transition Command, Kabul Afghanistan.

Brigadier General Boruff was commissioned as a second lieutenant in Field Artillery from the ROTC program at the University of North Carolina at Pembroke, North Carolina, where he received a Bachelor of Science in Accounting as a distinguished military graduate. He joined the Army Acquisition Corps in 1995. His advanced education includes a Master of Science in Acquisition and Contract Management, Florida Institute of Technology, Melbourne, Florida. His military education includes a Master of Science in Strategic Studies from the U.S. Army War College; Air Command and Staff College; Transportation Corps Advance Course; Multiple Launch Rocket System Cadre Course; and Field Artillery Basic Course.

Brigadier General Boruff has held numerous command and staff positions. His assignments include contingency contracting officer, XVIII Airborne Corps, Fort Bragg, North Carolina; assignment officer, Acquisition Management Branch, U.S. Army Human Resources Command, Alexandria, Virginia; executive officer to the Director, U.S. Army Acquisition Support Center, Fort Belvoir, Virginia; proponency officer, Army Acquisition Executive Support Agency, Pentagon; commander, Defense Contract Management Agency-Northern Iraq; deputy director, USAASC; commander, Defense Contract Management Agency, Combat Vehicles BAE Systems, York, Pennsylvania; project manager, Transportation Systems; director, Contracting Enabler Cell, Combined Security Transition Command Afghanistan; and, Commanding General of the Mission and Installation Contracting Command, Fort Sam Houston, TX.

His awards and decorations include the Legion of Merit with one oak leaf cluster, Bronze Star with two oak leaf clusters, Defense Meritorious Service Medal, Meritorious Service Medal with four oak leaf clusters, Joint Service Commendation Medal, Southwest Asia Service Medal, Afghanistan and Iraq Campaign Medals, Global War on Terrorism Service Medal, NATO-International Security Assistance Force Medal (Afghanistan), Saudi Arabian Kuwaiti Liberation Medal, and Kuwaiti Liberation Medal. He is authorized to wear the Army Parachute Badge, Air Assault Badge and Joint & Army Staff Identification Badge. In fiscal 1997, he was awarded the Secretary of the Army Award for Excellence in Contracting-Outstanding Contingency Contracting Officer; and, in fiscal 2009 he was named the Secretary of the Army Acquisition Director of the Year.

MG PATRICK DONAHOE, USA

Commanding General
U.S. Army Maneuver Center of Excellence

Major General Patrick J. Donahoe, a native of New Jersey, was commissioned an Armor Officer through Villanova University in May 1989. He has served in numerous company grade and field grade Armor and Cavalry positions in the continental United States, Germany, Bosnia, Kuwait and the Republic of Korea.

He most recently served as the deputy commanding general for Operations, Eighth United States Army in the Republic of Korea. Prior to serving in the Republic of Korea, he was the deputy commanding general for Operations and acting senior commander, 10th Mountain Division, Fort Drum, New York. His other general officer assignment was as the CJ-5, director of Plans, Headquarters Operation Resolute Support in Afghanistan.

Other previous assignments include: commander, 1st Battalion, 67th Armor Regiment, 4th Infantry Division at Fort Hood, Texas. While in command, the unit deployed to Iraq where the battalion conducted counterinsurgency operations in Babil and Karbala provinces and earned the Valorous Unit Citation for actions against the enemy.

Following battalion command, he was assigned to the National Training Center at Fort Irwin, California where he served initially, as a battalion trainer leading the Scorpion Team, and then led the Bronco Team as the brigade trainer. He commanded the 4th Cavalry Brigade at Fort Knox, Kentucky. He also served in Afghanistan as the Senior Advisor to General Sher Mohammed Karimi, the chief of the General Staff of the Afghan National Army.

Following that assignment he served as the chief of staff, U.S. Army Maneuver Center of Excellence at Fort Benning, Georgia.

He is a graduate of the Armor Officer Basic and Advanced Courses, the United States Naval Command and General Staff College, and Senior Service College Fellowship at Harvard University. He holds a Bachelor of Arts in History, a Masters of Advanced Military Studies, and a Masters of National Security and Strategic Studies.

COL RANDY EVERETT, USA (RET)

International Armaments Cooperation Staff Officer
U.S. Army Combat Capabilities Development Command

Mr. William "Randy" Everett is currently employed with the Department of Defense as an Employee at the US Army Combat Capabilities Development Command (CCDC). His focus is on Global Technology Integration working on Foreign Comparative Testing (FCT) programs for the US Army as well as serving as a desk officer for Australia.

Previously, Mr. Everett has been an affiliate Instructor at Loyola University located in Baltimore, Maryland where he has taught International Management and Business courses along with Advanced Leadership Develop Courses and Business Policy (Strategy) and Executive Education Seminars.

Mr. Everett is a Retired Colonel after thirty-three years in the United States Military. His final military assignment was Chief, National Guard Bureau J-5, International Affairs Division.

Preceding his assignment to the International Affairs Division, COL (Ret) Everett was assigned to the Iraqi Assistance Group. His focus was training Border Security Forces in operations at the Division, Brigade and Battalion levels.

A qualified Infantry and Special Forces officer, COL (Ret) Everett's career focus has been primarily within the arena of international relations, education, training and operations. Previous assignments within Infantry and Special Forces units have enabled him to understand operations from the squad to Division level.

Assignments within the military have been Detachment Commander of a Special Forces A-Team, Training and Executive officer of an Infantry Battalion, Senior Instructor and Operations Officer of a Training Academy, and Commander of an Infantry Battalion.

Colonel (Ret) Everett joined the military in 1975, and was commissioned as a Second Lieutenant of Infantry in September 1978. Throughout his thirty-three years of active and traditional service he has visited many countries including, Estonia, Germany, Kuwait, Iraq, Israel, Bulgaria, Bosnia-Herzegovina and Croatia.

Colonel (Ret) Everett graduated from the Naval Postgraduate School in December 1998 with a Masters of Arts in International Security and Civil Military Relations. He maintains a Baccalaureate degree from Regents College of New York in Liberal Arts. He was accepted into Johns Hopkins SAIS Doctorate of International Affairs program and began courses in the Fall of 2020.

His awards include a Legion of Merit, Bronze Star, Defense Meritorious Service medal, several Meritorious Service medals, Joint Commendation medal, mutable Army Commendation medals, Special Forces Tab, Master Parachute Badge, Combat Action Badge and a host of other awards to include a Campaign medal from Iraq and several Foreign Awards to include the Ukrainian Badge of Honor and Polish Service medal. He was inducted into Ft. Benning's Officer Candidate School Hall of Fame in 2012 and was nominated and found worthy to be added to the Order of St. Maurice.

William Everett is married to the former Elva L. Bourchel RN and they reside in Harford Country, MD.

COL WENDELL LEIMBACH, JR., USA

Director, Joint Intermediate Force Capabilities Office
U.S. Department of Defense

Col Leimbach was born and raised in Baltimore, MD, and graduated from Baltimore's Friends High School in 1988. He graduated from the University of Delaware 1992 with a BS in Computer and Information Sciences and a minor in History. He was commissioned a second lieutenant in the U.S. Marine Corps in July 1992 after completing Officer Candidate School. He was assigned as a Tank Officer and attended the Armor Officer Basic Course at Ft. Knox, KY in 1993.

As a lieutenant he served as a Tank Officer with the 2nd Tank Battalion, 2nd Marine Division in Camp Lejeune, NC, from 1993-1997. While there he served as the 2nd Platoon Commander, C Company and subsequently as the TOW Platoon Commander, H&S Company.

In 1997, then Capt Leimbach was assigned to his first tour with Marine Corps Systems Command (MCSC) in Quantico, VA as a project officer for the Program Manager for Tank Systems. Subsequently, in 1999 Capt Leimbach was sent to the Army Armor Captain's Career Course (ACCC) at Ft. Knox, and then back to 2nd Tank Battalion at Camp Lejeune. While at 2nd Tank Battalion Capt Leimbach served as the D Company Commander and assistant operations officer, and as the H&S Company Commander.

From 2002-2004, Maj Leimbach was a student at the Naval Postgraduate School (NPS) in Monterey, CA where he received a Master's Degree in Business Administration with a focus in Systems Acquisition Management. Upon graduation he was reassigned to MCSC and took on responsibilities as the Individual Armor and Load Bearing Team Leader for the Program Manager for Infantry Combat Equipment. While serving in that billet Maj Leimbach was selected as an Acquisition Professional Officer (8061) in the first year that the MOS was competitively offered.

In 2006, Maj Leimbach was transferred to PM Tank Systems where he served as the M1A1 Project Officer and then as acting Program Manager. In 2007 he was selected to serve as the Program Manager for Tank Systems where he contributed to the fielding of the programmable 120mm Multi-Purpose High Explosive (MP-HE) main gun ammunition. In August of 2010, LtCol Leimbach was reassigned to the office of the

Program Manager, Advanced Amphibious Assault, Program Executive Officer Land Systems where he served as the Deputy Director for the Marine Personnel Carrier Program until June of 2012.

From June 2012 to June 2013, LtCol Leimbach served as a Secretary of Defense Corporate Fellow. During that time he worked as a member of industry with Accenture Federal Services in Washington, DC. In 2013 he was selected to be the DPM AAA, Stafford, VA where he served supporting the sustainment of the Marine Corps' legacy Assault Amphibious Vehicle (AAV) fleet and the ACAT IC Amphibious Combat Vehicle (ACV) program. Col Leimbach was promoted to his current rank in September 2014. From mid-2017 to June 2018 he served as the Program Manager for AAA where he led that organization through a successful MS C for the ACAT IC ACV 1.1 Program. In October 2018, Col Leimbach was assigned as the Director of the Joint Intermediate Force Capabilities Office, Quantico, VA where he continues to serve to this date.

Col Leimbach's personal awards include the Army Achievement Medal, Navy and Marine Corps Achievement Medal, Navy and Marine Corps Commendation Medal, Meritorious Service Medal with gold star, Andrew J. Higgins Award for Acquisition Innovation and Excellence and the United States Cavalry and Armor Association Order of Saint George Bronze Medallion. He resides in Fredericksburg, VA with his wife and two children.

HONORABLE ELLEN LORD

Former Under Secretary of Defense for Acquisition & Sustainment

Senate Confirmed in August 2017, the Honorable Ellen M. Lord formally served as the Under Secretary of Defense for Acquisition and Sustainment (A&S). In this capacity, she was responsible to the Secretary of Defense for all matters pertaining to acquisition; developmental testing; contract administration; logistics and material readiness; installations and environment; operational energy; chemical, biological, and nuclear weapons; the acquisition workforce; and the defense industrial base.

Prior to this appointment, from October 2012 – June 2017, Ms. Lord served as the President and Chief Executive Officer of Textron Systems Corporation, a subsidiary of Textron Inc. In this role, she led a multi-billion dollar business with a broad range of products and services supporting defense, homeland security, aerospace, infrastructure protection, and customers around the world.

Ms. Lord has more than 30 years of experience in the defense industry, serving in a variety of capacities, to include Senior Vice President and General Manager of Textron Defense Systems, now Weapon & Sensor Systems; and Senior Vice President and General Manager of AAI Corporation, now known as Textron Systems' Electronic Systems, Support Solutions, and Unmanned Systems businesses. Earlier in her career, Ms. Lord served as Vice President of Integration Management for Textron Systems and Vice President of Intelligent Battlefield Systems for Textron Defense Systems, in addition to other business and operations positions.

Ms. Lord is a former Vice Chairman of the National Defense Industrial Association, as well as a former Director of the U.S. – India Business Council. She has served on the industry steering committee for the Center for New American Security's (CNAS) task force on "Strategy, Technology and the Global Defense Industry," as well as CNAS's DoD-Industry collaborative project "Future Foundry: Forging New Industries for Defense," which was formed to examine key technological trends and challenges facing the global defense industry. Ms. Lord has also served on the Board of Trustees of the U.S. Naval Institute Foundation.

Ms. Lord earned a Master of Science degree in Chemistry from the University of New Hampshire, as well as a Bachelor of Science degree in Chemistry from Connecticut College.

DONALD SANDO

Deputy to the Commanding General and Director of Capabilities Development & Integration

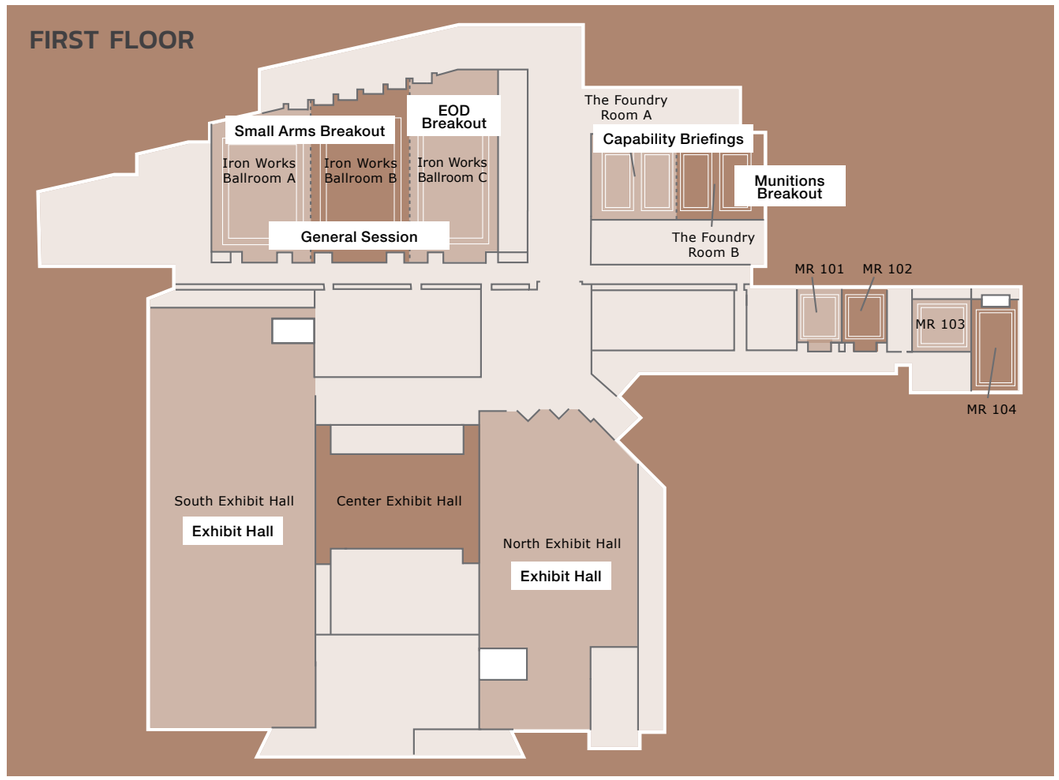
U.S. Army Maneuver Center of Excellence Company

Mr. Don Sando was selected to the Senior Executive Service in February 2008 and is currently assigned as the Deputy to the Commanding General and Director of Capabilities Development and Integration for the Maneuver Center of Excellence at Fort Benning, Georgia. As Director, Mr. Sando is responsible for conducting analysis and experimentation for the maneuver force, developing operational concepts and organizational designs, describing required materiel capabilities, and integrating solutions to support Army, joint, interagency, and multinational organizations.

Mr. Sando graduated from the United States Military Academy at West Point, New York, in 1981. He holds a Master of Science degree in Operations Research from the Air Force Institute of Technology, and a Master of Science degree in Strategic Studies from the Army War College.

Mr. Sando culminated over 26 years of active duty service as Director of the Infantry Futures Group, U.S. Army Infantry Center, Fort Benning, Georgia. His awards and decorations include the Distinguished Service Medal, the Legion of Merit, and the Combat Infantryman's Badge.

VENUE MAP



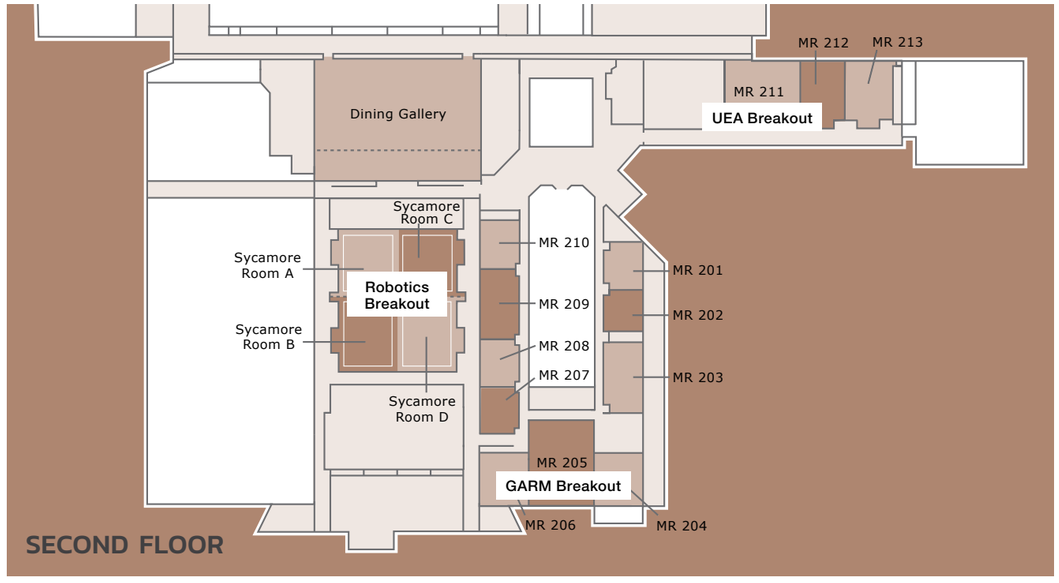


EXHIBIT HALL FLOORPLAN

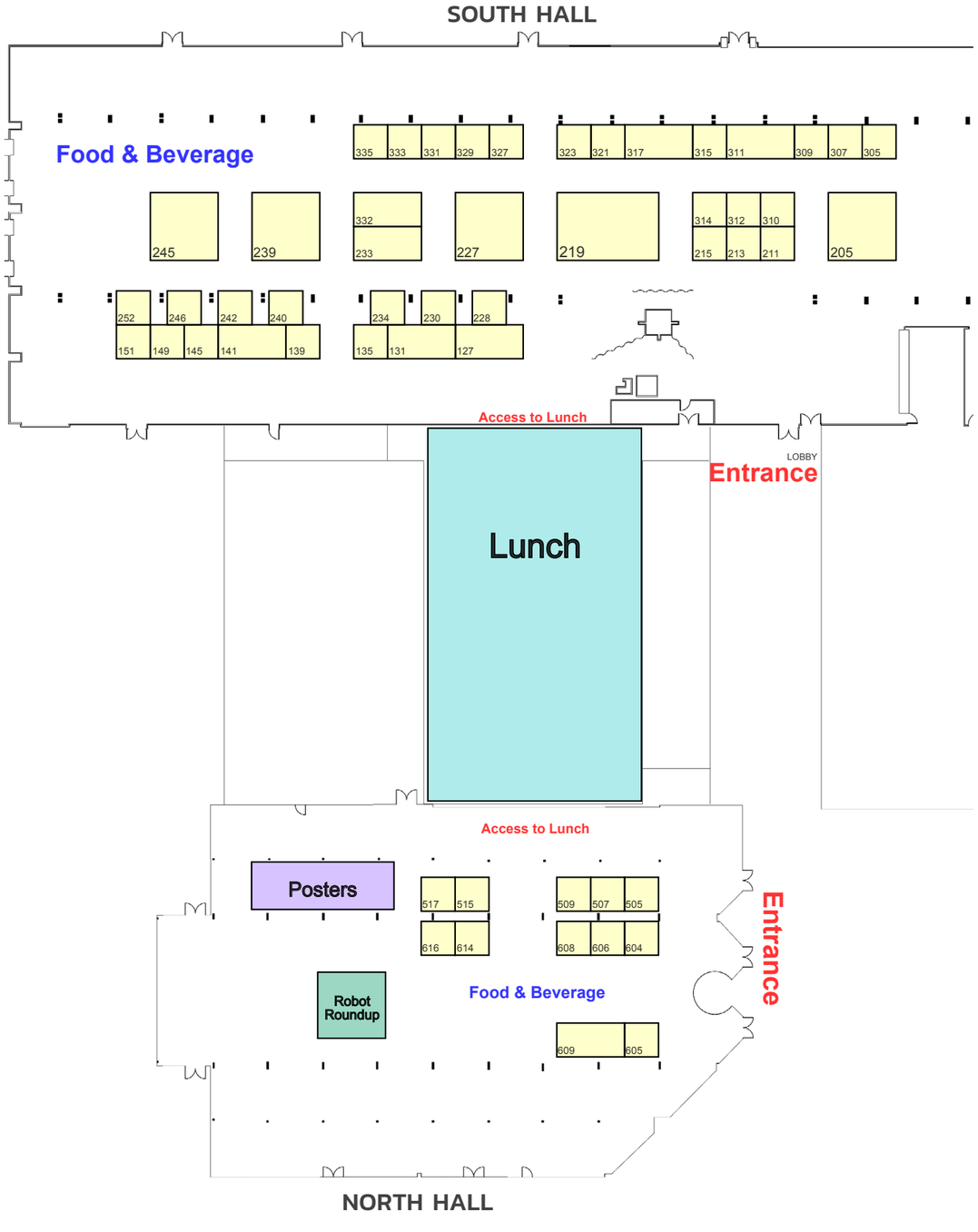


EXHIBIT HALL HOURS

TUESDAY, OCTOBER 19
9:00 am – 6:30 pm

WEDNESDAY, OC TOBER 20
9:00 am – 3:00 pm

EXHIBITORS BY COMPANY

EXHIBITOR DESCRIPTIONS

908 DEVICES 215

908 Devices is democratizing laboratory mass spectrometry with simple handheld and desktop devices. These devices are used at the point-of-need to interrogate unknown and invisible materials and provide quick, actionable answers to address some of the most critical problems in life sciences research, bioprocessing, pharma / biopharma, forensics and adjacent markets.

ADS, INC. 227

ADS, Inc. provides equipment, procurement, logistics, and supply chain solutions. We offer access to the largest product and service selection, the broadest array of procurement and contract options, and world-class expertise and support to assist you—every step of the way.

AERO PRECISION 307

Aero Precision is a leading manufacturer in the firearms industry. With roots in Aerospace, our quality and attention to detail are unmatched. When building something that flies, there is no margin for error. Aero always delivers extremely high-quality, American-manufactured rifles and components that your soldiers can count on.

AIMLOCK 317

Specializing in the development of organic autonomous precision strike weapon systems, AimLock enhances speed, accuracy, and reduced cognitive load for deployment of lethal fires from unmanned systems. AimLock's CORE engine offers decision accelerating autonomy in target detection, classification, identification, sensor fusion, and target prioritization, and shortened sensor-to-shooter times.

AIMPOINT INC. 505

For over 40 years, Aimpoint has been the world leader in design and manufacture of electronic red-dot sighting systems. Soldier tested and combat proven – don't settle for anything less.

APPLIED RESEARCH ASSOCIATES (ARA) 315

ARA is an international research and engineering company globally recognized for applying technically-excellent, in-depth and diversified research, engineering, and technical support services to provide answers to complex and challenging problems in the physical sciences. We have a broad range of technical expertise in defense technologies, civil engineering, computer software and simulation, systems analysis, environmental technologies, and blast testing and measurement.

B&T USA 507

B&T USA, a Florida-based firearms, silencer and accessories manufacturer operating under license of B&T AG SWITZERLAND, which was founded in 1991 as a designer and manufacturer of the industry's most advanced suppressors. Under the leadership of Karl Brügger, B&T AG has evolved into a world leader in the design, manufacture, and sale of the most technologically advanced, high performance weapons systems in the world. For more information on B&T USA, visit: www.bt-arms.com

BARRETT 240

Barrett Firearms Manufacturing, Inc. (Barrett) is the world leader in large-caliber and long-range rifle design and manufacturing. Our products are used by civilian sport shooters, law enforcement agencies, the United States military, and over 70 State Department approved countries. The Barrett Quality Management System has received the prestigious ISO 9001:2015 certification for the design and manufacture of firearms, ammunition, and accessories, and to provide training for those systems.

BREN-TRONICS, INC. 234

Supporting the Warfighter and EOD teams for 48+ years, all made in the US. Lithium-Ion batteries for every major military robot platform, small to large ground robots, air and sea. Chargers that get power from solar, vehicles, and other batteries in any climate between -40C / 80C. High power 24V Li-Ion batteries to start/power military vehicles (6T) + high energy power for mobile/fixed silent watch applications (>3 kWh). Winner: Conformal Wearable Battery (CWB) that also uses our ABC charger.

CEIA USA 242

CEIA Ground Search Metal Detectors provide overall superior performance in the areas of detection distance, soil compensation capability, and immunity to external interference. CEIA USA provides nationwide sales, service, and customer support to customers in North America. Dynamic solutions are the foundation of CEIA USA's commitment to customer satisfaction. For more information about CEIA USA, visit www.ceia-usa.com

DANIEL DEFENSE, INC. 614

Founded in 2000 by Marty Daniel, Daniel Defense, Inc. has grown to over 350 employees. Daniel specializes in the production of world class small arms to include complete weapons systems and best in class components- such as their Cold Hammer Forged Barrels provided to USSOCOM. Daniel has an unmatched production capability which is ISO 9001:2015 accredited and is located in Black Creek, GA near the port of Savannah.

DARLEY DEFENSE 239

Since 1908, W.S. Darley & Co. has been dedicated to serving the world's Fire and Emergency Services and Defense organizations. Darley remains a family owned and operated business. Our entire company is committed to customer satisfaction. Darley is dedicated to excellence and offers a diverse line of quality products and services through progressive design, manufacturing and worldwide distribution.

EOD GEAR 230

In order to achieve mission success you need the gear that performs to the level you operate. Focusing on your mission shouldn't include hoping your gear will perform as promised. It's wrong to compromise on gear which could cause mission failure. EOD Gear understands the consequences you face and can guide you to the best gear that works within your budget allowing you to focus on the target in front of you and win the fight.

EOS DEFENSE SYSTEMS USA, INC. 245

EOS is an industry leader in Remote Weapon Station (RWS) technology and manufacturing. Continuously investing to improve currently fielded and developing systems. We have built a strong reputation as a provider of weapon systems technology for over 25 years to not only the USA and Allied Countries.

FEDERAL RESOURCES 127

Federal Resources serves the vast global military and government markets facing critical defense developments and other challenges .Federal Resources excels in locating and delivering the exact tools teams require to proceed, quickly and efficiently. Awarded with multiple contract vehicles and trusted partner relationships, FR can assist you with the steps for a successful mission solution, on time and on budget.

GENERAL DYNAMICS – OTS 205

General Dynamics Ordnance and Tactical Systems manufactures large-, medium- and small-caliber direct and indirect-fire munitions; and is a leader in the development and production of lightweight tactical vehicles, weapons and armament systems. The company also produces propellants and non-lethal and force-protection products. More information about General Dynamics Ordnance and Tactical Systems is available online at www.gd-ots.com.

GHOST ROBOTICS 219

Ghost Robotics™ is revolutionizing legged robotics and the market for autonomous unmanned ground vehicles (Q-UGVs) used in unstructured terrain and harsh environments. Our Q-UGVs are rugged and unstoppable. Beyond all terrain operation, a core design principle for our legged robots is size-scalability, and reduced mechanical complexity with total software (SDK) control when compared to other legged and traditional wheeled and tracked UGVs on the market.

HDT GLOBAL 332

A provider of highly-engineered mobile military and emergency response solutions, HDT Global is widely recognized for its industry-leading production of state-of-the-art, fully integrated deployable solutions. With advanced systems currently being used by the U.S. and allied military units stationed worldwide, HDT's products include shelter systems, environmental control systems, generators, heaters, air filtration devices, parachutes, aerial delivery systems, and robotics.

IS4S 145

IS4S specializes in munition system design and development and brings the full spectrum of analysis, simulation, and testing resources to projects. We operate a series of ranges in Eastern Alabama in support of the Defense community. Our main areas of support are explosive testing (100+ lb. NEW), small and medium caliber testing, small-scale energetic synthesis and production, and test design and execution.

KGM TECHNOLOGIES 309

KGM Technologies is a U.S. based SDVOSB company, and a leader in the weapon suppressor industry with products that support .22LR to .50 BMG, bolt action, semi-auto, and full-auto weapons. KGM's innovative designs and cutting-edge manufacturing processes specialize in small arms suppressor technology, weapon enhancements, material science and high-level research and development. We are the largest most innovative suppressor technology company in the US.

L3 HARRIS 517

Next-generation robotic systems - going into harm's way so you don't have to. L3Harris develops cutting-edge robotic solutions for austere and harsh environments, drawing upon more than 20 years of research in advanced robotics. Driven by the continuous feedback of active duty operators, L3Harris builds powerful, versatile platforms that ensure mission success.

LEIDOS INNOVATIONS CENTER 327

The Leidos Xpose Portable X-Ray (Xpose XP) CR and DR Imaging System, provides a unique multi-function capability in a single kit. The Xpose XP is both a real-time imager and a flat-bed scanner for single and mosaic digital imaging panels. The Xpose XP can be used wired, wirelessly, or unwired/unpowered for operations in denied areas and environments where minimal electronic signature is desired. The Xpose XP is light weight, compact and IP67 rugged for use in any extreme environment.

LMT DEFENSE 305

Est. in 1980, Lewis Machine & Tool Company (LMT®) manufactures M4 type carbines, 7.62 x 51 rifles, and M203 40mm launchers. LMT is 100% US made and an ISO 9001:2015 registered US Govt. GSA contractor. Models include the MWS classified by the UK MOD as the L129A1 DMR and the 5.56 x 45 monolithic rifle with ambidextrous features, classified as the MARS-L, Modular Ambidextrous Rifle System, Light. Our products are currently in service with the US Govt., SOCOM, and 40 countries around the world.

MARATHON TARGETS 609

Marathon: COTS Autonomous Ground Robots since 2008. Our 6th Gen COTS Autonomous Robotic Target transforms live fire training from simple 'marksmanship practice,' into training against an Army of AI-driven robots. Lethality triples "in just one day" as ARTs react to fire by autonomously scattering for cover - or self-organizing a counterattack. Upgrading ranges to 'Robot-Capable Ranges' enables huge construction cost avoidance. Bulletproof ARTs go 30 miles/charge. Rental fleets on 4 continents.

MAXIM DEFENSE INDUSTRIES 606

MED-ENG 141

Med-Eng provides solutions for Explosive Ordnance Disposal (EOD) and related blast threats. Its Bomb Suits are trusted by the Army, Navy, Air Force and Marines for EOD, Unexploded Ordnance (UXO), Demining and Counter-IED. Med-Eng offers Hook And Line systems and specialized tools for EOD, UXO, Search and Tactical operations. Its Blast Sensors for the warfighter record detailed blast profiling data and forces impacting an individual, and improve operator safety through modified tactics.

MICRO-X INC. 604

Micro-X is an ASX-listed hi-tech company developing and commercializing Cold Cathode Carbon Nano-Tube emitter technology operating across global health, defence and homeland security domains. The technology enables X-ray tubes to be manufactured with significant reductions in weight, size, and power requirements. Originating in the medical sector the technology has transferred into the Counter IED market providing the development of leading-edge, stand-off X-ray technology.

MISTRAL INC. 616

Mistral Inc. serves as a "bridge" between the User requirements and innovative, relevant and ready solutions for the challenges faced while out in the field. Continuous analysis of capability gaps and existing technologies enables Mistral to stay ahead of the problems faced by Users today, tomorrow and into the future.

MITHIX PRO 323

Mithix Pro is a SDVO Small Business USA owned Manufacturer specializing in EOD, Combat Engineer, Special Ops and Demining, Counter-UXO, IED and Booby-Trap tools/tool kits and solutions. Our strengths are working with end-users at DoD, federal, state and local levels to manufacture, integrate, develop and/or supply custom tools/kits to meet mission needs.

NATIONAL ARMAMENTS CONSORTIUM (NAC) 312

The National Armaments Consortium (NAC) serves as the industry partner for the Department of Defense Ordnance Technology Consortium's (DOTC) and the Aviation and Missile Technology Consortium (AMTC). Our robust, transparent, and unique collaboration approach, once considered a novel and unrealistic concept, has evolved into a well-established process through which our DoD stakeholders acquire the innovative Armament technologies needed to maintain U.S. technological superiority.

NATIONAL DEFENSE INDUSTRIAL ASSOCIATION (NDIA) 509

NDIA engages thoughtful and innovative leaders to promote the best policies, practices, products and technology for warfighters and others who ensure the safety and security of our nation. NDIA offers 25 chapters, 27 divisions for corporate involvement, award winning publications, and numerous conferences and trade shows annually. Corporate and individual memberships are available. US government and military are welcome to join free of charge.

NOVO USA 139

NOVO DR Ltd. offers the highest image quality in the portable digital radiography industry. The ruggedness and reliability of our systems combined with amazing X-Ray Images make them the best in the market. Our intuitive and easy to use products have been designed and engineered by our incredibly professional and highly experienced team! We put a strong emphasis on the following points: Highest image quality, Reliability, Easy to Use, Professional Support

OTIS TECHNOLOGY 333

Otis Technology is known for manufacturing the most advanced firearms maintenance systems. The superior Breech-to-Muzzle® design combined with unmatched quality has positioned Otis as the gun care system of choice with the US Military, Hunters, Shooters and Law Enforcement professionals worldwide. Made in the USA, Otis Technology is AMERICA'S GUN CARE.

PATRIOT PRODUCTS, LLC 608

We specialize in the design and manufacture of Range Equipment (RTADS/TADSS), and are known for delivering custom solutions for military applications, expert field services - including maintenance of legacy systems, and standing behind our work with a full warranty ensuring client satisfaction is guaranteed. We pride ourselves on our loyalty and commitment to our clients, and hope you will let us do what we do best. Our mission will not be complete until your mission is accomplished.

PENDAR TECHNOLOGIES 135

Pendar X10™ offers breakthrough, short-range standoff Raman chemical identification capabilities for EOD, HAZMAT, Narcotics, Forensics, and more. It can be used at a standoff distance of up to 6 feet (2 meters), mitigates fluorescence and has minimal ignition risk with black powder and sensitive primaries. Simple point-and-shoot technology requires little training and delivers results within seconds. Pendar X10™ can be mounted on a UGV to put further distance between the operator and threat.

POINT ONE USA, LLC 329

Point One provides advanced EOD training, highest quality kits, systems, and training aid products such as hostage, WMD, underwater devices, ordnance, and clandestine laboratories. Our decades of experience in the SOF and EOD communities within joint, multi-agency, and national level environments ensure we are the best choice to provide the services offered, to include exercise support and research and development. As an SDVOSB, we are dedicated to preparing operators and bomb technicians in advancing capability.

QINETIQ, INC. 233

QinetiQ, Inc. provides cutting-edge technology and revolutionary products to the defense, security and military markets. Our product offerings include tactical land vehicle and aircraft protection, sensors to protect soldiers, unmanned robots in a variety of sizes and with varying capabilities and power and control systems. Customers rely on our products to enhance security, aid in personal safety, streamline operations, increase situational awareness and improve efficiencies.

RADICAL FIREARMS/RADICAL DEFENSE 311

Radical Defense is dedicated to delivering cutting-edge capabilities into the hands of soldiers and Law Enforcement. They provide innovative solutions to battle major issues with modern weapons. The most common issues that we have tackled head on are: Heat, thermal signatures, end user serviceability, longevity and reliability. Radical Defense is a true manufacturer with modern CNC and Additive manufacturing. They are capable of true RND, engineering, manufacturing and full production.

RECONROBOTICS, INC. 228

ReconRobotics® is the world leader in tactical, throwable micro-robots. Worldwide, nearly 7,000 ReconRobotics® robots have been deployed to the U.S. military and international friendly forces, federal, state and local law enforcement agencies, bomb squads and fire/rescue teams. Each day, they use the company's mobile Recon Scout® and Throwbot® devices to protect their personnel, minimize collateral damage, and gain immediate reconnaissance within dangerous and hostile environments.

SIERRA NEVADA CORP 213

SNC is a trusted leader in best-of-breed, open architecture engineering in Space Systems, Commercial Solutions, and National Security and Defense. SNC is recognized among The Top 10 Most Innovative Companies in Space, as a Tier One Superior Supplier for the U.S. Air Force and is the only aerospace and defense firm selected as a 2020 US Best Managed Company.

SMALL ARMS DEFENSE JOURNAL 246

Distributed at defense trade shows worldwide, Small Arms Defense Journal is a bimonthly publication focused on small arms, accessories, soldier gear, new products, industry news, and defense trade show reviews. Small Arms Review is a 10 issue publication. Our aim is to provide a forum for all aspects of Class 3 interests and the military small arms industry. Semper Fi highlights the charitable works and fellowship of the Marine Corps League and covers league and chapter events across the U.S.A.

SMARTRAYVISION 314

SmartRayVision Portable EOD X-Ray is designed, developed and manufactured by SharpLogixx LLC. Made in the USA in Green Bay Wisconsin, the SmartRayVision system is the #1 selling EOD kit in the country. SharpLogixx LLC is a leading technology company focused on advanced research and development of X-Ray equipment and specialized software.

SOUTHERN MACHINE WORKS 335

SMW is a make-to-print contract CNC machining concern providing machined components to Aerospace, Defense, and Commercial industries for over half a century. We provide precision CNC machining, fabrication, and welding services in an AS9100D + ISO9001:2015 and an ITAR controlled environment. Our central USA location is logistically advantageous for short transit times to all USA location(s). We offer prototype assistance, and excel at low, medium, and high-volume production machining.

SUREFIRE, LLC 321

Located in Fountain Valley, California, SureFire LLC is the leading manufacturer of high-performance flashlights, weapon-mounted lights and other tactical equipment for those who go in harm's way, or anyone who demands the ultimate in quality, innovation and performance. SureFire illumination tools are used by more SWAT teams and elite special operations groups than any other brand. SureFire is an ISO 9001:2015-certified company.

TELEDYNE FLIR 131

Teledyne FLIR offers a diversified portfolio that serves a number of applications in government & defense, industrial, and commercial markets. Our products help first responders and military personnel protect and save lives, promote efficiency within the trades, and innovate consumer-facing technologies. Teledyne FLIR strives to strengthen public safety and well-being, increase energy and time efficiency, and contribute to healthy and intelligent communities. Learn more at teledyneflir.com

TIP TECHNOLOGIES 211

TIP Technologies' suite of integrated modules offer a complete range of quality and compliance functions, while supporting the complex business requirements facing manufacturers today. Companies use our solutions to achieve measurable improvements, while advancing customer service, productivity and profitability. With real-time visibility into the production process, users can accelerate their reaction to a shift in quality and become more proactive about improving operational efficiencies.

TOMAHAWK ROBOTICS 331

Tomahawk Robotics is the leading innovator of common control solutions that transform how humans and unmanned systems work together to make the world more safe and secure. From the battlefield to remote industrial sites, our technology safeguard users working under the most extreme and stressful conditions. Kinesis is the only multi-domain, cross-architecture, AI-enabled control system that unlocks intuitive interaction with remote environments from across the room or around the world.

TRIJICON 605

Backed by a limited-lifetime warranty, Trijicon's aiming systems are proven on the range and in the field. As a result, Trijicon has earned the trust of those who are most in need of aiming accuracy and dependability. Our customers include the United States Navy, Marine Corps, Army, Air Force, and United States Special Operations Forces; United States Government, as well as state and local Law Enforcement.

TSSI 151

For more than 40 years, TSSi has provided the highest quality equipment & solutions for military, law enforcement, and disaster response professionals worldwide. TSSi maintains an extensive inventory of best selling items and has established partnerships with the industry's leading suppliers. TSSi is known for having the highest standards of integrity & professionalism. Long-term and comprehensive contracts include: DLA Tailored Logistics Support (TLS) and GSA.

T-WORX HOLDINGS, LLC 515

T-Worx Holdings has developed the Intelligent Rail® platform (aka "Picatinny Smart Rail") - a patented platform technology that powers, connects, and communicates data from rifles and weapon-mounted accessories to the soldier, squad, and command centers on and off the battlefield. Developed under US Army SBIR funding and direction and selected as the NATO Powered Rail STANAG in 2015, the Smart Rail is mature and ready for insertion on all next generation weapons and legacy small arms platforms.

UDC USA 149

UDC produces small & medium caliber ammunition of several types, as well as support munitions and demolition products. UDC is headquartered in Tampa, Florida with offices and facilities in the Kansas City, Missouri, USA metro area. UDC specializes in munitions manufacturing, prototyping and testing, full rate production, modernization of legacy weapon systems, and training and equipping of foreign military or indigenous defense forces.

UNIT SOLUTIONS 310

UNIT Solutions is dedicated to being the pre-eminent non-lethal training solution for law enforcement and military worldwide. Based on direct feedback from military and law enforcement professionals, we have custom engineered an affordable solution to directly address existing training challenges, and provide the best training system on the market for realistic force-on-force and decision-making training.

ZERO POINT, INCORPORATED 252

Zero Point offers innovative EOD and C-WMD products, training, and services. Our products and in-house Engineering services enable effective identification, diagnostics, disablement, and disposal of threats in hazardous situations all manufactured to meet superior quality. Our goal is to provide total mission solutions designed to defeat today's evolving threats. When you use a Zero Point product or service, Defenders are better prepared helping them come home safely.

SPONSORS DESCRIPTIONS

GEISSELE

PREMIER

Geissele Automatics is an American firearms and firearms parts manufacturer located in North Wales, Pennsylvania. William Geissele founded Geissele Automatics in 2004. Geissele is comprised of a team of highly-trained and dedicated individuals, whose mission statement is short: We Manufacture Confidence.

The company first entered the civilian market by manufacturing trigger mechanisms for the AR15 rifle. Throughout the years, while we haven't lost touch with our humble beginnings, we have evolved from manufacturers of trigger mechanisms to manufacturers of rifles and pistols for sport shooting, hunting, and personal defense.

Beyond our civilian customers, Geissele is committed to servicing the U.S. Department of Defense, U.S. Federal Law Enforcement Agencies, and our allies around the world. In fact, while our first trigger, the Hi-Speed National Match, was originally designed for target shooting and the CMP and NRA Hi-Power Rifle competition, it was found to have U.S. Military applications in semi-automatic sniper weapons and, in 2005, we received a request from the Department of Defense to build a select-fire trigger like the Hi-Speed National Match trigger. Geissele then designed and built the Geissele Super Select-Fire trigger, which was eventually adopted by entities in the U.S. Special Operations community and then became their trigger of choice for M4 carbine-based weapons.

Using state of the art machine technology and the most modern materials, we engineer, develop, and produce solutions to meet the unique and complicated needs of the modern-day warfighter.

In short, We are Weaponmakers® and we are committed to excellence in everything we do.

SNC SIERRA NEVADA CORPORATION

ELITE

Owned by Chairwoman and President Eren Ozmen and CEO Fatih Ozmen, Sierra Nevada Corporation (SNC) is a trusted leader in solving the world's toughest challenges through best-of-breed, open architecture engineering in Space Systems, Commercial Solutions, and National Security and Defense. For nearly 60 years, SNC has delivered state-of-the-art civil, military and commercial solutions to customers worldwide, including more than 4,000 space systems, subsystems and components. SNC has participated in more than 450 missions to space, including to Mars, and is recognized among The Top 10 Most Innovative Companies in Space. SNC is also a Tier One Superior Supplier for the U.S. Air Force and is the only aerospace and defense firm selected as a 2020 US Best Managed Company.

From engineers and scientists to cybersecurity experts and software developers, SNC's workforce of more than 4,000 dreams, innovates, inspires and empowers the next generation to transform humanity through technology and imagination.

THANK YOU TO OUR SPONSORS

KGM TECHNOLOGIES

Live Fire Demonstration

National Defense Corp

Wednesday Lunch

NORTHROP GRUMMAN

Monday Reception at the
National Infantry Museum

TEXTRON Systems

PUSHING PAST POSSIBLE

Tuesday Breakfast

GENERAL DYNAMICS
Ordnance and Tactical Systems

Tuesday Reception

PACSCI EMC

WIFI

QINETIQ

Registration and Lanyards

RMII
REACTIVE METALS INTERNATIONAL, INC.

Patriot

GLOCK®
PERFECTION

Tuesday Lunch