<table>
<thead>
<tr>
<th>Link</th>
<th>Topic #</th>
<th>Title</th>
<th>Objective</th>
<th>Business Area</th>
<th>LM SMEs Interested</th>
</tr>
</thead>
<tbody>
<tr>
<td>View Online</td>
<td>A17-117</td>
<td>Extremely High Frequency Rail-based Synthetic Aperture Radar</td>
<td>Develop a high-resolution, rail-based synthetic aperture radar capable of operating in bands within the 100-300 GHz frequency range.</td>
<td>LM Space Systems, LM Missiles and Fire Control (MFC)</td>
<td>Jesus Isarraras (<a href="mailto:jesus.isarraras@lmco.com">jesus.isarraras@lmco.com</a>) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>) Rebecca Gerakhovich (<a href="mailto:rebecca.gerakhovich@lmco.com">rebecca.gerakhovich@lmco.com</a>)</td>
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<td>View Online</td>
<td>A17-118</td>
<td>Improved PNT for Missile in Contested GPS Environments</td>
<td>Improve operational performance by enhancing position, navigation, and timing (PNT) on missile systems operating in contested GPS environments.</td>
<td>LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems, LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems &amp; Sensors (RMS IWSS)</td>
<td>Gretchen Head (<a href="mailto:gretchen.head@lmco.com">gretchen.head@lmco.com</a>) Jesus Isarraras (<a href="mailto:jesus.isarraras@lmco.com">jesus.isarraras@lmco.com</a>) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>) Rebecca Gerakhovich (<a href="mailto:rebecca.gerakhovich@lmco.com">rebecca.gerakhovich@lmco.com</a>)</td>
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<td>A17-119</td>
<td>Detect, Locate, and Mitigate GPS Threats</td>
<td>The objective of this topic is to develop an innovative approach to detecting, locating, and potentially mitigating RF sources of GPS jamming and spoofing.</td>
<td>LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems &amp; Sensors (RMS IWSS)</td>
<td>Gretchen Head (<a href="mailto:gretchen.head@lmco.com">gretchen.head@lmco.com</a>) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>) Rebecca Gerakhovich (<a href="mailto:rebecca.gerakhovich@lmco.com">rebecca.gerakhovich@lmco.com</a>)</td>
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<td>A17-120</td>
<td>Volumetric Spectral Diagnostics of Particle Laden Plumes</td>
<td>Three-dimensional measurements of the spectral emissions from particle laden, supersonic plume.</td>
<td>LM Space Systems, LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems &amp; Sensors (RMS IWSS)</td>
<td>Jesus Isarraras (<a href="mailto:jesus.isarraras@lmco.com">jesus.isarraras@lmco.com</a>) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>) Rebecca Gerakhovich (<a href="mailto:rebecca.gerakhovich@lmco.com">rebecca.gerakhovich@lmco.com</a>)</td>
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<td>A17-121</td>
<td>Significant Chemical Contributors to Observable Signatures of High Altitude Maneuvering Missiles</td>
<td>Development of hybrid flowfield modeling tools that produce accurate aerodynamic/thrust augmented maneuver forces and vehicle/exhaust plume flowfields as well as associated observable signatures for high altitude maneuvering configurations.</td>
<td>LM Space Systems, LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems &amp; Sensors (RMS IWSS) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<td>A17-122</td>
<td>Low-Order Models for the Evolution of Scalar and Vector Quantities in Supersonic Particle Laden Plumes</td>
<td>The production of data and low-dimensional, empirical-base models that will allow the enhancement and validation of numerical tools to move beyond anecdotal comparisons for particle laden missile plumes.</td>
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<td>A17-123</td>
<td>Accurate Hybrid Flowfield Approaches for High Altitude Maneuverability</td>
<td>Development of modeling tools that properly account for flame lifting within the exhaust plumes of missile threats to Army assets.</td>
<td>LM Space Systems, LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems &amp; Sensors (RMS IWSS) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<td>Observables of Signatures of Missiles Threats to Army Interests in the Field</td>
<td>Development of modeling tools that properly account for flame lifting within the exhaust plumes of missile threats to Army assets.</td>
<td>LM Space Systems, LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems &amp; Sensors (RMS IWSS) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<td>A17-125</td>
<td>Development of Volumetric Spectral Diagnostics of Particle Laden Plumes</td>
<td>Three-dimensional measurements of the spectral emissions from particle laden, supersonic plume.</td>
<td>LM Space Systems, LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems &amp; Sensors (RMS IWSS) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<td>Low-Order Models for the Evolution of Scalar and Vector Quantities in Supersonic Particle Laden Plumes</td>
<td>The production of data and low-dimensional, empirical-base models that will allow the enhancement and validation of numerical tools to move beyond anecdotal comparisons for particle laden missile plumes.</td>
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<td>LM Space Systems, LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems &amp; Sensors (RMS IWSS) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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Note: The table above provides an overview of various topics and their objectives related to space systems and technologies. Each topic is associated with specific business areas and interested LM SMEs. The table entries include links to view online details for each topic.
Enhanced Fire Control Radar (FCR) Stationary Target Detection

Develop new algorithms to enhance detection and classification of stationary ground targets for rotary wing aircraft based radars.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)

Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)

GSV Electromagnetic Environment Interrogation and Exploitation

Develop a system to allow an unmanned ground vehicle to: 1) intercept radio transmissions and classify them as Friendly, Coalition or Adversary; 2) provide direction of transmissions; 3) disrupt adversary transmissions.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)

Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)

Single Surface High Altitude Low Opening Parachute

Develop a High Altitude Low Opening (HALO) parachute canopy with a single surface providing lift capability that leverages high strength bonded fabrics.

LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)

Kenneth Critz (kenneth.a.critz@lmco.com)

Shipboard Dimensional Analysis Tool (SDAT)

Marine Corps Ground Vehicle Acquisition PMOs and Navy Amphibious and Prepositioning Ships PMOs do not have a precise way of determining shipboard vehicle transportability constraints early enough in the design process. Develop an automated capability which allows the user to pull up the desired ship scan, select the vehicle of interest, specify desired vehicle-to-ship clearance distance, conduct 3D-physical interference analysis, and generate reports on the transportability results.

LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)

Kenneth Critz (kenneth.a.critz@lmco.com)

Enhanced Technology for Man-Portable Targeting Systems

Reduce the future targeting system weight, size, and warfighter cognitive load by applying advanced algorithms, hardware (if necessary), and processing to assist the warfighter with the tasks of target detection, identification, recognition, and location.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)

Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)

Electro-Magnetic Interference Composite Rigid Wall Shelter (EMI CRWS)

The objective of this topic is to develop an electro-magnetic interference (EMI) composite rigid-wall shelter (CRWS) that integrates the use of lightweight composite materials, carbon conduction paths, and corrosion resistant coatings to provide a lighter, more energy efficient, and durable capability to the Marine Corps, supporting the goals of our expeditionary operations. The EMI CRWS shall incorporate composite structural and panel components that shall be capable of meeting military and commercial EMI shielding standards, and Convention of Safe Conduct (COS) requirements.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)

Gretchen Head (gretchen.head@lmco.com)

Low Probability of Detection On the Move Communications for Artillery Batteries

Provide a low data rate, on-the-move, removable, and man-packable, communications system for the High Mobility Artillery Rocket System (HiMARS) and associated Artillery Battery systems while simultaneously providing the capability to not interfere with existing communications and minimize enemy counter targeting capabilities. Existing communications systems do not adequately manage transmit power to prevent detection and would be unsuitable for use in the Artillery Battery.

LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)

Kenneth Critz (kenneth.a.critz@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)

Data Integrity and Confidentiality Resilient Operating System Environment for Multi-Level Security

Develop software to maintain a common trusted resilient operating system environment for hand-held devices (small), portable computers (medium), and tactical server (large) computing environments that can maintain data integrity and switch between multiple security classification levels without requiring removal of a hard disk. Data integrity must be maintained even in the presence of "zero-day" vulnerabilities or other information Operations threats. Resilience is to be maintained, defined as automatic rapid restoration of full operational capability to a known good state.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)

Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)

Optimize Additive Manufacturing (AM) Post-Build Heat Treatment (MT) and Hot Iso-static Pressing (HIP) Processes for Fatigue Performance using an Integrated Computational Materials Engineering (ICME) Framework

Utilizing an Integrated Computational Materials Engineering (ICME) framework, develop an innovative multi-scale, multi-physics tool capable of optimizing Additive Manufacturing (AM) post-build processes of metal (such as Ti-6Al-4V, 17-4PH, or 15-5PH) parts for fatigue performance, reducing the amount of post-processing necessary to achieve the best possible performance without deteriorating the other mechanical properties.

LM Aeronautics [Aero] Technologies
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)

Craig Owens (craig.owens@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)

Low Probability of Intercept / Low Probability of Detection Underwater Acoustic Source

Develop innovative active sonar technologies to increase the availability of environmental measurements.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)

Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)

Vision of Radar and Electro-Optical/InfraRed (EO/IR) for Ship Classification and Identification

Develop an innovative approach that exploits new methodologies in machine learning and modern mobile computing devices to fuse information obtained from different sensor types in order to achieve dramatic improvement in target classification and identification capability for space, weight and power (SWaP) constrained platforms.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)

Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)

Advanced Body Force Cuing for Dynamic Interface Simulation

Develop the capability of a realistic body force cuing system, including hardware and software, for training pilots in a helicopter simulator in the shipboard environment.

LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)

John Fontana (john.c.fontana@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
N172‐110 Virtual Antenna Array Mapping
Develop an advanced antenna array mapping technology and algorithms capable of emulating phased phased array antenna behavior in real-time using distributed ad hoc antenna array layouts to provide warfighters, unmanned aerial vehicles (UAVs), and military vehicles on the move the ability to sweep or broaden the resulting beam collectively so as to communicate or jam targets.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
Gretchen Head (gretchen.head@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

N172‐111 Ultra‐High Frequency Clutter Model for Airborne Surveillance Radar
Develop a model of clutter returns in the Ultra High Frequency (UHF) frequency band. The model will support Live‐Virtual‐Constructive (LVC) testing of the E‐2D platform via a direct inject radar stimulator.
John Fontana (john.c.fontana@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

N172‐112 Relevant Image Mosaic – Image Management Algorithm Development
Develop a more sophisticated image management capability for Intelligence, Surveillance and Reconnaissance (ISR) and Remote Sensing systems and currently exists with focus on the management of imagery from various platforms, while also expanding capability to address still‐frame imagery from tactical sources.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
John Fontana (john.c.fontana@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
Gretchen Head (gretchen.head@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

N172‐113 Long Endurance Compact Sonobuoys Power Source
Develop a stand‐alone sonobuoy power source capable of a six‐year storage life.
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
John Fontana (john.c.fontana@lmco.com)

N172‐114 High Bandwidth Fast Steering Mirror
Design, develop and test a 3‐Hz bandwidth fast steering mirror to be used in the next generation beam control systems on airborne platforms for high power laser weapon systems.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
John Fontana (john.c.fontana@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
Gretchen Head (gretchen.head@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

N172‐115 Selective Emission of Light Utilizing Functionally‐Graded Energetic Materials
Develop a customizable software program that provides outputs to result in a suite of training tools and technologies that supports recreation of aviation mishap events to convey lessons learned and improve safety training through classroom based videos and interactive, immersive visualization techniques.
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
John Fontana (john.c.fontana@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
Gretchen Head (gretchen.head@lmco.com)

N172‐116 Laser Target and Analysis Board Development
Develop a laser target board designed to measure the incident power and beam shape of laser energy in an outdoor, and potentially induced by the blade‐pass frequency of the engines.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
John Fontana (john.c.fontana@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
Gretchen Head (gretchen.head@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

N172‐117 Reliable Target Area of Uncertainty from an Underwater Acoustic Source(s)
Develop a robust algorithm that produces a reliable, more precise generated from a multi‐static active sonar field of drifting source and receive sonobuoys.
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
John Fontana (john.c.fontana@lmco.com)

N172‐118 Reliable Target Area of Uncertainty from an Underwater Acoustic Source(s)
Develop a shipboard system for the Improved Navy Lighterage System (INLS) Warping Tug to determine wave characteristics (significant wave height, period and direction) in near‐real time using Warping Tug motions as input.
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
John Fontana (john.c.fontana@lmco.com)

N172‐119 Inflatable Multi‐Platform Recovery System
Develop a man‐ portable, rapidly deployable, inflatable tactical boat. Note: The small craft towing vessel and inflation source (e.g. compressed air/SCUBA bottles) will be provided and are not part of the desired inflatable system.
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
John Fontana (john.c.fontana@lmco.com)

N172‐120 Mitigation of Helmet Vibration
Perform experimentally validated Finite Elements Analysis (FEA) on the E‐2D flight helmet (HGU‐68/P) and develop an optimized solution to mitigate helmet vibration experienced during flight, potentially induced by the blade‐pass frequency of the engines.
LM Aeronautics (Aero)
LM Missiles and Fire Control (MFC)
Craig Owens (craig.l.owens@lmco.com)
John Fontana (john.c.fontana@lmco.com)

N172‐121 Spayless Connectors for Optical Fiber
Develop an innovative method for terminating optical fiber with an eyepiece connector.
LM Aeronautics (Aero)
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
John Fontana (john.c.fontana@lmco.com)

N172‐122 Spayless Connectors for Optical Fiber
Develop a robust algorithm that provides a reliable, more precise generated from a multi‐static active sonar field of drifting source and receive sonobuoys.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
LM Aeronautics (Aero)
Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
Craig Owens (craig.l.owens@lmco.com)

N172‐123 Wave Characterization from Improved Navy Lighterage System (INLS) Warping Tug Motions
Develop a shipboard system for the Improved Navy Lighterage System (INLS) Warping Tug to determine wave characteristics (significant wave height, period and direction) in near‐real‐time using Warping Tug motions as input.
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
John Fontana (john.c.fontana@lmco.com)

N172‐124 inflatable Multi‐Platform Recovery System
Develop a man‐portable, rapidly deployable, inflatable tactical surface system to facilitate the high‐speed surface tow of a disabled underwater vehicle (e.g. SEAL Delivery Vehicle, Shallow Water Combat Submersible) behind any small craft capable of achieving 20 knots speed over water (e.g., rigid hull inflatable boat). Note: The small craft towing vessel and inflation source (e.g. compressed air/SCUBA bottles) will be provided and are not part of the desired inflatable system.
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
John Fontana (john.c.fontana@lmco.com)

N172‐125 Out‐of‐Autoclave Composite Curing Utilizing Nanostuctured Heaters
To develop innovative approaches to cure and repair composite aircraft structures without utilizing an autoclave ("Out of Autoclave Composites") using nanostruconstrued heaters.
LM Aeronautics (Aero)
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Gretchen Head (gretchen.head@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Lead-Salt Infrared Detectors
Develop infrared detectors which can operate at room temperature with detectivity greater than 1 x 10^11cmHz^1/2/W and noise-equivalent power (NEP) less than 1 pWHz^1/2 with cutoff wavelengths spanning the range of 3.5 to 4.6 microns for Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Naval applications.

ACV Autonomous Sled Technologies
With the Marine Corps acquisition of the Amphibious Combat Vehicle (ACV) 1.1, there is a need to move the vehicles from ship to shore at higher speeds and greater ranges than can be provided by the vehicle itself. The goal is to develop a low cost detachable ACV with improved range and speed as it moves from ship to shore.

Numerical Methods Combat Power and Energy Systems (CPES)
Develop innovative mathematical techniques for the characterization of total ship power and energy system performance that includes new high energy, pulse load weapon systems. Performance characterization supports early stage ship design synthesis.

Electromagnetic Shielding
Develop a multi-functional material system or component of minimal thickness to protect components from the extreme magnetic fields generated during acceleration of a launch package from an electromagnetic launcher. Adequate compressive strength (100-300 KPSI) and minimal weight and volume should be maintained.

Resolving organizational inefficiencies through crowdsourcing
Develop a computational model and a platform that can identify and resolve inefficiencies in large hierarchical organizations using crowdsourcing techniques.

Aerospace Blasting Nozzle Noise Control
Develop technologies to improve the acoustics performance of abrasive blasting nozzles for paint and surface coatings removal. The objective is to investigate the noise generation mechanisms of abrasive blasting operations and develop a quiet, effective and efficient nozzle. This development is to optimize the acoustics and productivity performance of blasting nozzles and demonstrate a novel approach to address MIDS JTRS thermal concerns. Document, assess and rank any new cooling technology based on applicability, performance and integration complexity to a military communications and data terminals. Pursue feasible technology candidate(s) for transition into MIDS JTRS terminals.

Fixed-Rate Time High Power Radio Frequency (HPRF) Pulse Shaping
Develop, design, and build an affordable, compact HPRF pulse shaping device or switch that can operate at L and S band frequencies from 1 to 4 gigahertz (GHz) and handle up to 8 megawatts (MW) of power. The solution should provide the unique capability to shape a square pulse envelope of 10 nanoseconds (ns) for both rise and fall times and vary pulse widths from 10 ns to 2.5 microseconds (µs). The final product must provide a high degree of flexibility in the pulse shape and the ability to support high (1 kHz) pulse repetition rates.

Navy Approved Multi-Factor Authentication for Personal Mobile Devices
Define and develop a software-based solution the U.S. Navy to validate the existence and security posture of government-purpose mobile apps that use Multi-Factor Authentication (MFA) into mobile device applications would employ differing categories (knowledge, possession, and inheritance) in concert to authenticate users relying on varying infrastructure to ensure continuity of service during single (ideally multiple) points of failure.

Advanced Cooling Technologies for Multifunctional Information Distribution System (MIDS) Terminals
Identify and/or develop innovative heat transfer technologies or novel approaches to address MIDS JTRS thermal concerns. Document, assess and rank any new cooling technology based on applicability, performance and integration complexity to a military communications and data terminals. Pursue feasible technology candidate(s) for transition into MIDS JTRS terminals.

Circumvention and Recovery Radiation Effects Mitigation For Modern Electronics
Develop a Circumvention and Recovery (C & R) power and data management design to support functions for shutdown, restart and recovery of high performance processors, memory, System on Chip platforms, Radio Frequency, and advanced inertial measurement sensor subsystems.

Navy Aeronautics (Aero)

LM Aeronautics (Aero)

LM Missiles and Fire Control (MFC)

LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)


LM Missiles and Fire Control (MFC)

LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)


LM Missiles and Fire Control (MFC)

LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)


LM Space Systems

LM Space Systems

LM Missiles and Fire Control (MFC)

LM Missiles and Fire Control (MFC)

LM Missiles and Fire Control (MFC)

LM Missiles and Fire Control (MFC)
**N172-139 Safe Primary Battery**
Develop and demonstrate advanced battery technologies for a primary battery that can meet submarine launched ballistic missile requirements with a specific energy equal to or greater than current silver zinc battery technologies.
LM Space Systems
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Jesus Isarraras (jesus.isarraras@lmco.com)
Kenneth Gritz (kenneth.a.gritz@lmco.com)

**N172-140 High Power Solid State Electronic Switch for Use in Exploding Foil Initiator Applications**
Develop and demonstrate a high power electronic solid state switch which may be used to initiate an exploding foil initiator for use in submarine launched ballistic missile (SLBM) systems and/or private sector launch platforms such as the SpaceX Falcon 9 rocket.
LM Space Systems
LM Missiles and Fire Control (MFC)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)

**N172-141 Alternative Mixing Technologies for High-Energy, Solid Propellants**
Develop and demonstrate alternative methods for mixing of high-energy, solid propellants for large, up to 20 gallons in volume, gas generators for Navy strategic missile post-boost propulsion systems, other large missiles, and launch vehicles.
LM Space Systems
LM Missiles and Fire Control (MFC)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)

**AF172-001 Damage Tolerance Analysis of Grinding Burn Cracks in High Strength Steels**
Develop special methods, data, or applications for the modeling and crack growth analysis of thermally induced cracks located in grinding burns of high strength steel landing gear parts.
LM Aeronautics (Aero)
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Craig Owens (craig.l.owens@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Kenneth Gritz (kenneth.a.gritz@lmco.com)

**AF172-002 Demonstration and Validation of Brush LHE Alkaline Zn-Ni as a Brush Cathode (Cd) Alternative**
The objective of this effort is to demonstrate and validate LHE alkaline Zn-Ni brush plating as a replacement for selective (brush) Cd plating on Cd plated, aluminum coated (such as IVD), or LHE alkaline Zn-Ni plated components.
LM Missiles and Fire Control (MFC)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)

**AF172-003 UV cured maskant robotic application with self-masking**
Develop a robotic application system for Dymax UV cured maskants that ALSO masks the areas that are to be plasma sprayed. Without the need to trim the maskant overspray after the application or have to mask prior to the application of the mask.
LM Aeronautics (Aero)
LM Missiles and Fire Control (MFC)
Craig Owens (craig.l.owens@lmco.com)
John Fontana (john.c.fontana@lmco.com)

**AF172-004 Constant Speed Drive Input Shaft Monitor**
An effective method is needed to determine revolutions of Constant Speed Drives in support of Condition Based Maintenance (CBM).
LM Aeronautics (Aero)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
Craig Owens (craig.l.owens@lmco.com)
Kenneth Gritz (kenneth.a.gritz@lmco.com)

**AF172-005 Hardware Modeler Replacement for Digital Device Simulation**
The D30X hardware modeler supports development and maintenance of test programs to test and indicate repair actions for avionic circuit card assemblies. The replacement is required to maintain this capability for current and future avionic repairs.
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
John Fontana (john.c.fontana@lmco.com)
Kenneth Gritz (kenneth.a.gritz@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)

**AF172-006 Unique Modular, High Power, Cascadeable Amplifier for support of EMP Direct Drive Testing**
Determine feasibility and develop concepts for a high power, modular amplifier design to support wideband (10 kHz–2 GHz), with minimum 10 kW Average Power, and capability to drive load impedances from short to open circuits for Direct Drive testing.
LM Missiles and Fire Control (MFC)
LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)

**AF172-007 Conversational Personal Assistants for Air Force Operations Centers**
Develop and demonstrate a conversational personal assistant application for operators in an Air Operations Center environment.
LM Missiles and Fire Control (MFC)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)

**AF172-008 Cost Estimating Relationships for Evaluation of Rapidly Evolving Technologies**
To develop methodologies, tools and associate procedures to enable the assessment of the life cycle costs and enhanced capabilities associated with the incorporation of emerging technologies.
LM Aeronautics (Aero)
LM Space Systems
LM Missiles and Fire Control (MFC)
Craig Owens (craig.l.owens@lmco.com)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)

**AF172-009 Applications Using New Satellite Communications Constellations**
Develop and demonstrate applications or services that take advantage of new and emerging non-geostationary orbit (NGSO) satellite communications constellations. Help condense the time between deployment of NGSO constellations and their operational capability by the Air Force.
LM Space Systems
LM Missiles and Fire Control (MFC)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)

**AF172-010 Threat Detection Using Artificial Intelligence and Machine Learning**
Adapt and apply multi-int sensor and machine learning to identify, understand and help mitigate threats to Air Force installations.
LM Rotary and Mission Systems, Cyber, Steps and Advanced Technologies (RMS CSAT)
LM Space Systems
LM Missiles and Fire Control (MFC)
Zweichen Head (zweichen.head@lmco.com)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)

**AF172-011 LWIR IADCo APD Receiver**
Design, develop, demonstrate, and produce a prototype II/IV avalanche photodiode receiver array in 3.0-4.6 micron range with greater than 250 noise equivalent photon sensitivity and greater than 100 A/D bandwidth.
LM Space Systems
LM Missiles and Fire Control (MFC)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)

**OS03-72-DX**
**Improving the Ranking and Prioritization of Attack-related Events**
Develop methods to focus limited human security specialist resources on highest value indicators, and increasingly automate responses, when continuously monitoring complex collections of assets for signs of an attack.
LM Space Systems
LM Missiles and Fire Control (MFC)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerakhovich (rebecca.gerakhovich@lmco.com)
New Online
OSD172-DI2 Micro-Platform Protection (MiPP)
Develop capabilities to facilitate the application of cyber protection techniques, methodologies, algorithms, and capabilities to micro-platform devices in development, ultimately reducing their capacity to become significant threat vectors.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
Gretchen Head (gretchen.head@lmco.com)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

New Online
OSD172-DI3 Automated Reconﬁguration of Mission Assets
Provide a capability that can rapidly and automatically reconﬁgure protected IT assets (e.g., multi-tier servers) in response to an ongoing cyber-attack.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
Gretchen Head (gretchen.head@lmco.com)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

New Online
OSD172-DI4 Network Isolation of Industrial Control System (ICS) Devices via Permanent Host Identifiers
Develop a solution to isolate critical ICS devices from general network trafﬁc while maintaining network connectivity between devices, between devices and trusted administration entities, and without deploying additional code to the devices.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

New Online
SB172-001 Compact and Scalable Bidirectional Electronic BioInterfaces
Design and fabricate electronic bidirectional "headstage" system(s) for performing large-scale neurophysiology studies involving multichannel neural recording and microstimulation in awake and freely behaving animals.
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)

New Online
SB172-002 Improved Mass Production of Beneficial Insects
Develop innovative engineering (e.g., automation or bio-sensing technologies), genetic, and/or genomic approaches to reduce the negative characteristics associated with insect colony production to be used for a variety of purposes in agricultural production or agricultural research (e.g., edible insects, natural enemies for biological control of agricultural pests, pathogens, or weeds, etc.). Projects focusing on mosquito production are discouraged from applying.
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)

New Online
SB172-003 Development of Gene-Encoded Monoclonal Antibody Potency Assay
Develop genericizable gene-encoded monoclonal antibody (mAb) potency assays for assessing formulated nucleic acid constructs that encode prophylactic monomolecular antibodies. Demonstrate and validate the technology for at least three distinct indications.
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)

New Online
SB172-004 Super-Resolving Phase Filter for Improved 3D Printing, Machining and Imaging
Design and fabricate an optical phase filter capable of modifying an incident wave into a "super-resolved spot", i.e. into a beam that is more tightly focused than a diffraction-limited focal spot. The optical phase filter design should permit its use at Ultra-Violet (UV), visible, and Infrared (IR) wavelengths. The objective is to provide at least an order of 10 improvement in current spot sizes for 3D printing, laser cutting and welding and an improved point spread function for imaging while maintaining high transmission efficiency for all applications.
LM Space Systems
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

New Online
SB172-005 Plug and Play Analysis and Simulation
Develop and test one or more techniques for plug and play interoperability of computer-aided engineering (CAE) and computer-aided design (CAD) that would allow automated use of new and legacy simulation tools with CAD models obtained from a variety of sources.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
Gretchen Head (gretchen.head@lmco.com)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

New Online
SB172-006 Collective Allostatic Load
Design, develop, validate, and deploy integrated systems for collecting, aggregating, processing, and analyzing data related to "Collective Allostatic Load" (CAL), to provide quantitative and predictive measures of a team or group’s performance resilience or dysfunction in the face of potentially multiple acute and chronic stressors. Envisioned capabilities will enable near-real time measurement of a group’s state beyond the simple aggregation of individual stress levels.
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

New Online
SB172-007 Analyzing Human Dimensions of Software Engineering Processes
Develop approaches to associate human behaviors, across the software development lifecycle, with the production of correct versus faulty or insecure code.
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

New Online
SB172-008 Ecosystem of Secure Software Components around the sel4 Microkernel
Build out the open-source ecosystem of secure software components around the sel4 operating system microkernel.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
Gretchen Head (gretchen.head@lmco.com)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

New Online
SB172-009 Accelerated Low-power Motion Planning for Real-time Interactive Autonomy
Develop a system for embedded real-time motion trajectory planning in novel environments and on diverse size, weight, and power (SWaP) constrained platforms.
LM Space Systems
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)

New Online
SB172-010 Electromagnetically Switchable Optical Filter
Develop and demonstrate a compact, electromagnetically actuated two state optical filter that can rapidly switch between broadband transmission, and narrow line bandpass with high out of band optical rejection.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
Gretchen Head (gretchen.head@lmco.com)
Jesus Isarraras (jesus.isarraras@lmco.com)
John Fontana (john.c.fontana@lmco.com)
<table>
<thead>
<tr>
<th>Topic Number</th>
<th>Topic Title</th>
<th>Description</th>
<th>Author(s)</th>
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<tbody>
<tr>
<td>DHA172-001</td>
<td>Reconfigurable/Recyclable Modules for Patient Simulators</td>
<td>To create low-cost, sensor-laden soft materials with mechanical properties similar to specific human tissues which can be dissolved and re-fabricated into different shapes with little or no additional materials required, with the exception of replacement sensors. These low-cost, sensor-laden soft materials would provide add-on compatibility with at least one generic manikin or part-task trainer in at least one common anatomic site for intravenous medical interventions.</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<tr>
<td>DHA172-002</td>
<td>Textile Point of Injury Integrity Integrated Circuit</td>
<td>This research should provide technical non-repudiation of combat-related records generated at the time of injury. The National Institute of Standards and Technology Federal Information Processing Standards (NIST FIPS) 140-2 level 3/4 approved hardware-based cryptographic modules with a weight, size, and power budget no greater than the integrated circuit on a Personal Identity Verification/Common Access Card (PIV/CAC); this will generate a digital signature across the injury record. A prototype application that looks and appears to operate like the Department of Defense (DoD) Military Health System (MHS) MHS GENESIS (1) electronic health record (EHR) system for deployed military treatment facilities (MTFs). This light capability would license or emulate (with license) the Cerner EHR Graphical User Interface (GUI) used in the MHS GENESIS product, would present only a small technical footprint, and could be employed as both a smart card and a smartphone application.</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<tr>
<td>DHA172-003</td>
<td>Hybrid Smart Client/Web Browser Based Light MHS GENESIS Application for Agile Theater Operations</td>
<td>To develop a prototype light web-browser based smart client application that looks and appears to operate like the Department of Defense (DoD) Military Health System (MHS) GENESIS (1) electronic health record (EHR) system for deployed military treatment facilities (MTFs). This light capability would license or emulate (with license) the Cerner EHR Graphical User Interface (GUI) used in the MHS GENESIS product, would present only a small technical footprint, and could be employed as both a smart card and a smartphone application.</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<tr>
<td>DHA172-004</td>
<td>Medical Information System Software Maintenance Capability</td>
<td>The objective of this topic is to develop and demonstrate an innovative software maintenance capability on Windows, Linux, and Android-based platforms that enable Military Health System program management offices to establish and perform automated maintenance tasks on file systems, operating systems, web servers, databases, medical information system applications, and other system components through a software maintenance agent. The innovation of this research is prototyping of a technical concept and approach to provide an inclusive cross platform software maintenance application that allows for execution of user specified maintenance instructions with decision support to allow for maintenance of complex systems such as current and future Electronic Health Record. This innovation will incrementally advance the state of the art maintenance mechanisms to remove the training requirement and task performance required of end users to perform information system maintenance in a deployed environment.</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<tr>
<td>DHA172-005</td>
<td>Finger Pulse Oximeter for Patient Identification and Predictive Algorithms</td>
<td>The objective of this topic is to research, prototype, and demonstrate a wireless finger pulse oximeter with an onboard optical fingerprint sensor integrated with an embedded ultra-wideband wireless transmission capability. The fingerprint sensor will enable the medical treating the casualty to identify of the patient and enhance the capability to associate a variety of vital signs; i.e. Arterial Oxygen Saturation (SpO2), Photoplethysmogram (PPG) waveforms, etc. from multiple patient medical encounters.</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<tr>
<td>DHA172-006</td>
<td>Mobile Causality Display Toolkit for Tactical Combat Casualty Care</td>
<td>The objective of this topic is to develop and demonstrate a robust and ruggedized mobile causality display toolkit for Tactical Combat Casualty Care (TCC).</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<tr>
<td>DHA172-007</td>
<td>Next-Generation Ear Seals for Circumaural Headsets and Hearing Protectors</td>
<td>Develop improved circumaural ear seals for hearing protection and communication devices that have the ability to better fit to the features of the Service member's head and eyewear providing an improved seal, reducing environmental stress while providing an improved level of noise attenuation to help reduce incidence of hearing loss.</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<tr>
<td>DHA172-008</td>
<td>Point of Care Test for Disease Severity and Risk Stratification</td>
<td>Develop an easy to use diagnostic tool for risk stratification and disease severity at point of care utilizing the complete blood count test.</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<tr>
<td>DHA172-009</td>
<td>Complex Crystalloid Resuscitative Fluid</td>
<td>Develop a novel crystalloid resuscitative fluid which improves outcome following severe hemorrhage when compared to the current standard of care crystalloid.</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<tr>
<td>DHA172-010</td>
<td>Medical Wearable for First Responder Assessment and Remote Monitoring</td>
<td>Develop and deliver a low power biometric wearable device capable of collection, storage, and transmission of electrocardiogram (ECG) rhythm, temperature, pulse, and other vital human physiological function data. System must provide near real-time remote patient monitoring in combat, transport, and critical care environments.</td>
<td>John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
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<td>Proposal</td>
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<tr>
<td>DHA172-011</td>
<td>Concentrated Lactated Ringer’s Injectable Solution</td>
<td>Develop an FDA-approved concentrated Lactated Ringer’s injection solution at reduced weight, cube and/or cost of current product(s).</td>
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<tr>
<td>DHA172-012</td>
<td>Solutions for Restoration of Urinary Function and Control</td>
<td>Develop, design, and demonstrate new technology or therapies that will replace or restore damaged, missing or non-functional urinary system and allow patient control over urination.</td>
<td></td>
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<tr>
<td>DHA172-013</td>
<td>Minimally Invasive Delivery of Therapy to the Inner Ear</td>
<td>To develop an easily-administered medical device that will safely deliver intratympanic medical treatments to the inner ear, where the hearing and vestibular systems are housed.</td>
<td></td>
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<tr>
<td>DHA172-014</td>
<td>Development of an Individualized Portable Platform to Deliver Vestibular Rehabilitation</td>
<td>To develop a customizable platform to deliver vestibular rehabilitation using technology to improve compliance to home program, adapt rehab strategies to individual needs, and return individuals to daily activities more efficiently.</td>
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<tr>
<td>DLA172-002</td>
<td>Increase Competition through Small Business Source Approval for DLA Land and Maritime FMD Hard to Source Items</td>
<td>Improve product availability and increase competition through the development of Small Business eligible manufacturing sources for DLA Land and Maritime FMD Hard to Source Items.</td>
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<tr>
<td>DMEA172-001</td>
<td>Computerized Automatic Delayering and Polishing System</td>
<td>Develop a tool for automated, procedural delayering and polishing of semiconductor microelectronic devices.</td>
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<tr>
<td>DMEA172-002</td>
<td>Through‐Lens Fiducial Marking System</td>
<td>Develop a tool for through-lens fiducial marking on the backside of semiconductor devices.</td>
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<tr>
<td>DTRA172-001</td>
<td>Applications of Ultra‐Low Cost Differential Pressure Sensors to the Large N Acoustic Sensor Problem</td>
<td>To develop an economically feasible solution to the Large N sensor problem for acoustic measurements.</td>
<td></td>
</tr>
<tr>
<td>DTRA172-002</td>
<td>High Performance Computing (HPC) Tools for Topology Aware Mapping of Inter‐node communication</td>
<td>Modern High Performance Computers often feature a hierarchical interconnect topology that features non-uniform latency and bandwidth between nodes. The objective of this project is to develop approaches for building a High Performance Computing oriented performance toolkit containing libraries, runtime, and or tools that can be used by an application developer to perform topology-aware domain placement on distributed HPC platforms.</td>
<td></td>
</tr>
<tr>
<td>DTRA172-003</td>
<td>Tools for Memory Hierarchy Optimization on Pre‐Exascale HPC Architectures</td>
<td>The objective of this project is to develop a performance analysis toolkit (augmenting an existing overall performance tools framework) that can be utilized by developers to guide code modernization and optimization for upcoming pre-exascale high performance computing (HPC) platforms. Planned pre-Exascale HPC platforms will feature many-core systems with deep memory hierarchies.</td>
<td></td>
</tr>
</tbody>
</table>
Automated Approaches to Analyze and Identify Dual Use Research of Concern from Scientific Publications

Conduct proof of concept studies that will enable the automatic identification of open scientific publications that pose dual use concern.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)

Gregchen Head (gregchen.head@lmco.com)

Development of Ultracapacitors with High Energy Density and Low Leakage

Develop an ultracapacitor with energy greater than 450 Wh/kg, retain charge for at least 30 days, and operate from -40 degrees Celsius to 40 degrees Celsius.

LM Missiles and Fire Control (MFC)

John Fontana (john.c.fontana@lmco.com)

Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

Hardware-in-the-Loop Scintillation Simulator for MILSATCOM links in a Nuclear Disturbed Communication Environment

To develop a simulator or simulators that accurately replicate the statistics that describe the radio frequency channel parameters, for a satellite communication link, in a nuclear disturbed environment.


Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

Non-Saturating, Real-Time Battlefield Dosimeter

To develop a portable neutron/gamma real-time dosimeter for replacement of currently deployed systems such as the UDR-13 and PDR-75A. Proposed systems must provide highly accurate dose measurements within a few seconds of dwell time, and avoid saturation while measuring the extremely high radiation flux from


Rebecca Gershkovich (rebecca.gershkovich@lmco.com)

Field Debris Analysis for Nuclear Forensics

Develop a field-deployable mass spectrometer for nuclear forensics debris analysis.

LM Missiles and Fire Control (MFC)

John Fontana (john.c.fontana@lmco.com)

Jesus Isarraras (jesus.isarraras@lmco.com)

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Rebecca Gershkovich (rebecca.gershkovich@lmco.com)
Develop an advanced closed loop control system that minimizes reaction time latencies during missile flight.

LM Space Systems
LM Missiles and Fire Control (MFC)
Jesus Isarraras (jesus.isarraras@lmco.com)

John Fontana (john.c.fontana@lmco.com)

Design and develop future missile systems avionics based upon innovative Commercial-off-the-shelf (COTS) components. Develop innovative approaches to leveraging modern miniaturized electronics to the fullest extent possible as replacements for existing missile system avionics.

LM Space Systems
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)

Extracting high resolution 3D models from images of textured and non-textured surfaces in an uncontrolled environment.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerskhovich (rebecca.gershkovich@lmco.com)

Develop novel techniques to identify and locate uncommon targets in overhead and aerial imagery, specifically when few prior examples are available. Initial focus will be on panchromatic electro-optical (EO) imagery with a subsequent extension to multispectral imagery (MSI) and/or synthetic aperture radar (SAR).

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerskhovich (rebecca.gershkovich@lmco.com)

Develop a fast automated signal matching algorithm based on hashing algorithms.

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LM Missiles and Fire Control (MFC)
Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)
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John Fontana (john.c.fontana@lmco.com)

Develop algorithms and techniques that provide superior digital elevation data constituting the surfaces of fixed structures in urban or highly structured environments using remote sensing image data.

LM Space Systems
LM Missiles and Fire Control (MFC)
Jesus Isarraras (jesus.isarraras@lmco.com)
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John Fontana (john.c.fontana@lmco.com)

Develop robust, automated super resolution image processing techniques to use on low resolution video of objects under a changing pose.

LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)

LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)

Develop novel ways to update display electronics to maximize native OLEO performance within exploitation displays for high-end imagery visualization needs. Design and breadboard prototype techniques that demonstrate sustaining dynamic sharp pixel edge rendering by OLEO primitives with novel drive circuits, interfaced with an interoperable display port interface.

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Gretchen Head (gretchen.head@lmco.com)
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Rebecca Gerskhovich (rebecca.gershkovich@lmco.com)

Develop novel nutraceutical and/or pharmaceuticals to enhance important USSOCOM Multi-Purpose Canine (MPC) performance attributes that optimize their performance, improve recovery time when wounded and increase their survivability.

LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerskhovich (rebecca.gershkovich@lmco.com)

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Rebecca Gerskhovich (rebecca.gershkovich@lmco.com)

The objective of this topic is to develop innovative Group 1 (<20 pounds) Unmanned Aerial Systems (UAS) to satisfy intelligence, surveillance, and reconnaissance capability gaps that support United States Army Special Operations Forces missions.

LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
LM Missiles and Fire Control (MFC)
Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)
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Rebecca Gerskhovich (rebecca.gershkovich@lmco.com)

The objective of this topic is to develop innovative technologies that increase the probability of a first round hit or effects on target with a standard 60mm, 81mm or 120mm mortar tube; using standard munitions and changes; out to the maximum effective range of the weapon system. Focus will be on an easy to operate, self-contained suite of sensors and computational power mounted to the weapon system.
AF17B-T001 AFFF Disposal
A novel technology that achieves permanent disposal of Aqueous Film-Forming Foam (AFFF) and associated perfluorocarbon components.
Kenneth Critz (kenneth.a.critz@lmco.com)

AF17B-T002 Closed-Loop Feedback Control for Transcranial Direct Current Stimulation
Develop a physiological recording and feedback control system to monitor operator cognitive state and control a small, head mounted transcranial direct current stimulation system.
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)

AF17B-T003 Resilient Directional Mesh Enhanced Tactical Airborne Networks
Develop stable and resilient directional airborne networking technologies to support enhanced and assured mission success while maintaining backward compatibility with data link technologies currently in use by airborne platforms.
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerashkovich (rebecca.gershkovich@lmco.com)

AF17B-T004 Mission and Information Assurance through Cyber Atomics
Develop a cyber assurance system that expands the reach of information management and control to the network, and processes operations in an atomic manner to secure operations from harm and manipulation.
LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)
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Rebecca Gerashkovich (rebecca.gershkovich@lmco.com)

N17B-T031 Materials Modeling Tool for Alloy Design to Streamline the Development of High Temperature, High-Entropy Alloys for Advanced Propulsion Systems
Develop a materials modeling tool for alloy design to streamline development of high temperature, high-entropy alloys for advanced propulsion systems.
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)

N17B-T032 Techniques to Adjust Computational Trends Involving Changing Data (TACTIC-O)
Develop technology based on statistical or computational methods to assist in the continued tracking of training performance and proficiency trends as underlying tactical data changes.
Rebecca Gerashkovich (rebecca.gershkovich@lmco.com)

N17B-T033 Optimized Build Plate Design Tool for Metal Laser Powder Bed Additive Manufacturing
Develop a software tool capable of optimizing the build plate design for metal powder bed additive manufacturing (AM) systems based on part geometry and features, part location and orientation with respect to the build plate and build direction, as well as the thermal effects inherent in AM. The part’s location, orientation, and support structure will be optimized to minimize induced residual stress, control geometric distortion, effectively manage heat dissipation, and mitigate the effort needed in post-process support removal.
LM Aeronautics (Aero)
Craigh Owens (craig.l.owens@lmco.com)
Kenneth Critz (kenneth.a.critz@lmco.com)

N17B-T034 Risk-Based Unmanned Air System (UAS) Mission Planning Capability
Develop an Unmanned Air System (UAS) pre-flight mission planning capability that utilizes path planning algorithms to minimize risk to personnel and property during UAS flight operations while reducing preparation times.
LM Aeronautics (Aero)
Craigh Owens (craig.l.owens@lmco.com)
Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)

N17B-T035 Mission Success Assessment and Mitigation Recommendations Using a Cognitive System
Develop a cognitive system as a selectable Unmanned Aircraft System Control Segment (U CS) Service with potential application in Naval Air Systems Command (NAVAIR) Common Control System (CCS).
LM Aeronautics (Aero)
Craigh Owens (craig.l.owens@lmco.com)
Gretchen Head (gretchen.head@lmco.com)
John Fontana (john.c.fontana@lmco.com)
Rebecca Gerashkovich (rebecca.gershkovich@lmco.com)

DHA17J-002 Pivotal Point of Injury Integrity Integrated Circuit
This research should provide technical non-repudiation of combat related records generated at the time of injury. The National Institute of Standards and Technology Federal Information Processing Standards (NIST FIPS) 140-2 level 3/4 approved hardware-based cryptographic modules with a weight, size, and power budget no greater than the integrated circuit on a Personal Identity Verification/Common Access Card (PIV/CAC); this will generate a digital signature across the injury record. A prototype will be constructed and the resulting record will be loaded into the warfighter’s medical record. Workflows will be developed for reducing duplicate medical records, ensuring medical information is associated with the correct injured party, ensuring the integrity of the medical sensor information recorded at the time of injury, and back end systems (Purple Heart Medals and VA disability eligibility).
Kenneth Critz (kenneth.a.critz@lmco.com)

DHA17J-001 Handoff Training for Combat Casualty Care (H CCS)
Develop a training framework capable of working with current DoD systems that employs virtual, mixed, and/or live simulation training strategies capable of providing caregivers the opportunity to master handoff protocols from the point of injury through the continuum of care.
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)

DHA17J-002 Handoffs for Joint Service Casualty Care (HSSCC)
Develop and validate empirically derived combat casualty handoff protocols and tools which can be used across all military branches of the armed forces with the potential application to other healthcare settings.
LM Missiles and Fire Control (MFC)
John Fontana (john.c.fontana@lmco.com)
<table>
<thead>
<tr>
<th>Project No.</th>
<th>Description</th>
<th>Objective</th>
<th>Responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHA17B-003</td>
<td>Fast Parameter Identification for Personalized Pharmacokinetics</td>
<td>To develop a novel and fast computing scheme for constructing personalized pharmacokinetic models. The scheme must rely on (i) a limited set of measurements for each individual patient and (ii) a knowledge base of existing well-calibrated models for a collection of diverse individual in order to approximate in silico the structure of metabolic interactions for a given individual patient by solving a parameter identification problem.</td>
<td>LM Missiles and Fire Control (MFC) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
</tr>
<tr>
<td>DHA17B-004</td>
<td>Robust Biochemical and Biomarker Rapid Detection and Assay System for Field Use</td>
<td>Devise and develop a rugged diagnostic platform for general biochemical and biomarker analysis, which can be used under prolonged field conditions and in isolated, austere environments.</td>
<td>LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) Gretchen Head (<a href="mailto:gretchen.head@lmco.com">gretchen.head@lmco.com</a>) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
</tr>
<tr>
<td>DHA17B-005</td>
<td>Oxygen Production and Delivery on Demand</td>
<td>To develop an efficient technology for medical grade oxygen generation with water as the feedstock and to provide a potential solution (deliverable prototype hardware) for the Army’s medical oxygen requirement (or other DoD requirement).</td>
<td>LM Missiles and Fire Control (MFC) John Fontana (<a href="mailto:john.c.fontana@lmco.com">john.c.fontana@lmco.com</a>)</td>
</tr>
</tbody>
</table>