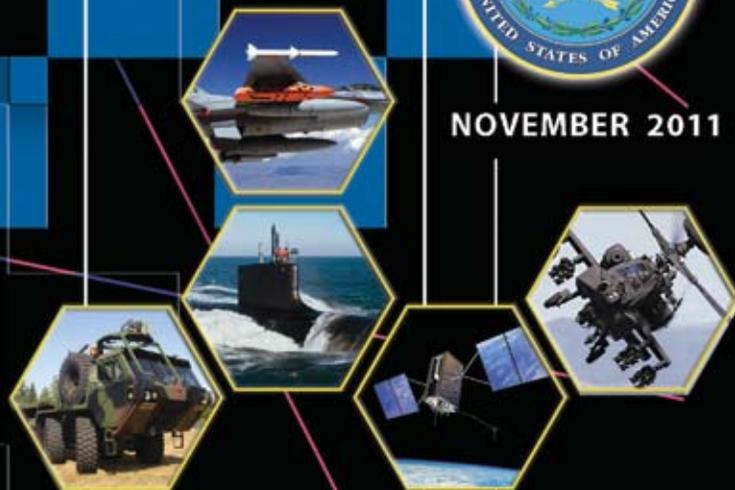




NOVEMBER 2011

ManTech



STRENGTHENING INDUSTRIAL CAPABILITY
THROUGH INNOVATION, COLLABORATION,
AND STRATEGIC INVESTMENT





ACQUISITION,
TECHNOLOGY
AND LOGISTICS

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

Our Soldiers, Airman, Sailors, and Marines continue to fight on multiple fronts and in diverse environments where they are supported by the most capable, dynamic, and competent industrial base in the world. It is one of our critical responsibilities as the Department of Defense to monitor, engage, and invest in our national industrial base to ensure those Warfighters have the systems necessary to successfully execute their daily missions. My office, Manufacturing and Industrial Base Policy (MIBP), carries out this mission on behalf of the Under Secretary of Defense for Acquisition, Technology, and Logistics. A central element of these efforts is the Manufacturing Technology (Man Tech) program. For over 50 years, The DoD ManTech program has been the Department's investment mechanism for staying at the forefront of defense-essential manufacturing capability. ManTech focuses on the timely development, production, and sustainment of defense systems, and thereby enhances our affordability and technological edge in a dynamic, diverse, and evolving threat environment.

This annual brochure highlights the Warfighter impacts of products and processes transitioned to use by the ManTech programs of the Office of the Secretary of Defense, the Departments of the Army, Navy, and Air Force, and the Defense Logistics Agency. The success stories enclosed demonstrate the ability of ManTech programs to provide affordability, reduce manufacturing lead time, provide faster surge capabilities, improve technology implementation, improve manufacturing processes for greater reliability, and rapidly respond to Warfighter requirements.

This year's center section highlights the changes brought on by the 2011 National Defense Authorization Act to ensure responsiveness to the Department's current and future industrial base needs. Changes include the formation of my new position as Deputy Assistant Secretary of Defense for MIBP, and aligning oversight of the ManTech Program and its associated Joint Defense Manufacturing Technology Panel (JDMTP) under MIBP.

One of the key thrusts of the MIBP office's mission is to partner with industry to inject a new spirit of innovation into the Department to ensure our Warfighters are the beneficiaries of the best technology advances that industry can provide.

I see ManTech as a key to fostering that innovation by meeting the challenge of our changing world and ensuring our Nation maintains its competitive edge on the battlefield. I am pleased to lead and be a part of the ManTech team, which continues to enhance our national security industrial base for the protection of our future.

Sincerely,

A handwritten signature in blue ink, appearing to read "B. Lambert".

Brett B. Lambert
Deputy Assistant Secretary
Manufacturing and Industrial Base Policy

MISSION STATEMENT

The DoD Manufacturing Technology (ManTech) Program anticipates and closes gaps in manufacturing capabilities for affordable, timely, and low-risk development, production and sustainment of defense systems.

FOCUS

An important focus of ManTech is on the manufacturing technologies, processes, and enabling production capabilities that reduce the acquisition and sustainment cost of weapon systems, and provide direct benefit to the Warfighter. Measures of effectiveness include improved mission capability, improved readiness, and reduced total ownership costs. Timely transition of the technology consistent with acquisition and operational requirements is essential.

STRATEGY

The DoD Manufacturing Technology Program Strategic Plan prepared in 2009 by the Office of the Secretary of Defense in close collaboration with the JDMTP contains four strategic thrusts:

- Thrust 1: Effective management and delivery of processing and fabrication technology solutions
- Thrust 2: Active support for a highly connected and collaborative defense manufacturing enterprise
- Thrust 3: Active support for a strong institutional focus on manufacturability and manufacturing process maturity
- Thrust 4: Active support for a healthy, sufficient and effective defense manufacturing infrastructure and workforce

The ManTech Program strategy is to balance its traditional emphasis on processing and fabrication technology solutions with active support for broader defense manufacturing needs. 21st century defense manufacturing relies on a networked, collaborative, and increasingly global supply base, with capabilities that can be linked between and among all stakeholders – from developer to user to sustainer – to respond rapidly to dynamically changing defense needs.

The ManTech successes documented herein are categorized by the appropriate strategic thrust. The majority of ManTech projects support Thrust 1. The center two pages of this document highlight changes brought about by the FY11 National Defense Authorization Act that establishes the new position of Deputy Assistant Secretary of Defense of Manufacturing and Industrial Base Policy (MIBP) and moves the DoD ManTech office under the oversight of the Office of MIBP.

VISION

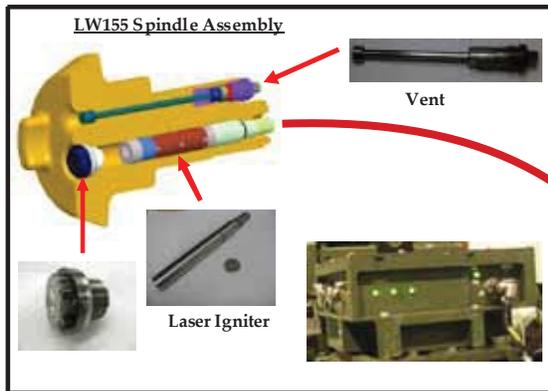
“A responsive world-class manufacturing capability to affordably and rapidly meet Warfighter needs throughout the defense system life cycle.”



ManTech Develops Laser Ignition Manufacturing Processes for Large Caliber Artillery Weapons Application

The Challenge:

The Warfighter needs a safer, more reliable and affordable ignition system to replace its primer-based ignition systems currently used on U.S. 155 mm large caliber weapons systems. Laser ignition can meet this need, however standard processes to manufacture laser ignition are immature and unable to meet large caliber artillery weapons size, weight, cost, and performance requirements.



LW155 DPLIS Spindle Assembly



LW155 M777A2 Lightweight Howitzer

ManTech Response:

- Army ManTech developed and demonstrated robust and affordable manufacturing processes for a diode-pumped laser ignition system (DPLIS) for use in large caliber artillery weapons such as the M777A2 Lightweight Howitzer (LW155) and Paladin (M109A6)
- Formulated unique manufacturing methods that conform to thermal, high shock, configuration, and performance requirements imposed on 155mm large caliber artillery laser ignition systems
- Army ManTech invested \$5.9M with \$2.8M leveraged funding from the Technology Transition Initiative

Impact:

- Demonstrates a safe, reliable propellant ignition system for the Warfighter and enables remote, automated fire
- Advances diode laser technology by increasing diode temperature operation capability beyond current industry's capability (**from 85° C to 115° C**)
- Increases laser ignition system manufacturing rate from 1 to 3 laser igniter units per day

Reduces diode laser igniter unit production cost by ~50% (from \$55K to \$27K)



THRUST ONE

PROCESSING & FABRICATION

ManTech Increases Affordability of Joint Strike Fighter by Improving Fiber Placement

The Challenge:

F-35 Joint Strike Fighter (JSF) wing skins use carbon fiber bismaleimide (BMI) composites to reduce weight and improve operational performance. Optimization of the automated fiber placement (AFP) process for BMI material is necessary to enhance productivity and make the fabrication of wing skins and nacelle structure more affordable.



Optimized automated fiber placement of BMI carbon fiber tape improves JSF affordability



ManTech Response:

- A multi-disciplinary team consisting of Lockheed Martin Aerospace, Hitco Carbon Composites, MAG Cincinnati, and Cytec Engineered Materials determined material, machine, and process interactions in the manufacturing environment
- Designed experiments were used to identify material and machine interactions and the effects of process parameters
- Process modifications, including installation of infrared heating technology and use of high density polyethylene components to reduce friction, were tested and validated
- Navy ManTech investment of \$3.7M

Impact:

- Effort led to increased lay-down rate of BMI AFP fabrication by 47% for wing skin and 62% for nacelle structure
- Manufacturing protocols and support fabrication technology inserted real-time into the production of flight hardware for all three versions of the JSF aircraft - CV, STOVL, and CTOL
- Production transition of these ManTech protocols accomplished with the JSF Wing and Nacelle skin AFP partners
- Fabrication schedules compressed and capital equipment investment reduced

Estimated cost savings of \$100M



ManTech Increases Manufacturing Throughput of Integrated MEMS Packaging

The Challenge:

Next-generation smart weapons need small, low-cost, deeply integrated Inertial Navigation Systems / Global Positioning Systems (INS/GPS) that are also capable of being gun-hardened while increasing accuracy, mission flexibility, survivability, and standoff range.



*HG 1940
MEMS*

ManTech Response:

- Air Force ManTech worked with Honeywell Aerospace to improve the manufacturing process for both Integrated Micro Electro-Mechanical System (MEMS) Accelerometer and Gyro sensors
- Increased manufacturing throughput by developing the ability to screen sensors at the chip level before assembly
- Matured technology to a Manufacturing Readiness Level (MRL) of 8 for the Integrated MEMS Accelerometer and MRL 6 for the Gyro
- Air Force ManTech invested over \$8.4M while collaborating with Army and Navy ManTech

Impact:

- Lowered price on average of 59% by improving processes and yields
- Reduced cost of Inertial Measurement Units (IMUs) from \$5K/unit to less than \$3K/unit
- Increased aided and unaided navigation accuracy, increased g-hardness, and reduced susceptibility to external jamming
- Accelerated Low Rate Initial Production by 3 years for Honeywell IMUs

Cost avoidance of over \$200M for 111,000 munitions

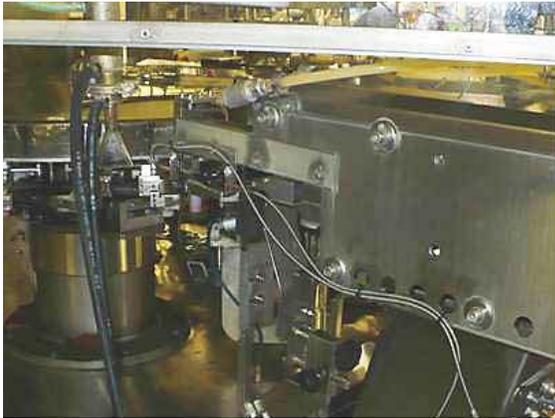


THRUST ONE PROCESSING & FABRICATION

ManTech Improves Quality and Assures Safety of Meals Ready-to-Eat for Our Military

The Challenge:

Meals Ready to Eat (MRE) entrees are contained in hermetically-sealed multi-laminate foil pouches. The filling process occasionally leaves entrapped matter in the seal area which prevents the pouch from being reliably sealed with traditional heat sealing methods.



Ultrasonic MRE Sealer Unit



ManTech Response:

- DLA's Combat Rations Network for Technology Implementation (CORANET) program demonstrated proof of concept for MRE ultrasonic seal production method to reliably seal MRE pouches
- Ultrasonic seals meet or exceed package-integrity requirements even with significant seal-area contamination
- DLA ManTech investment of \$1.2M

Impact:

- Improved food safety with fewer defects
- 70% decrease in product rework costs
- Production lines fully implemented at all ration producer facilities to include AmeriQual, Wornick Foods, and SOPAKCO

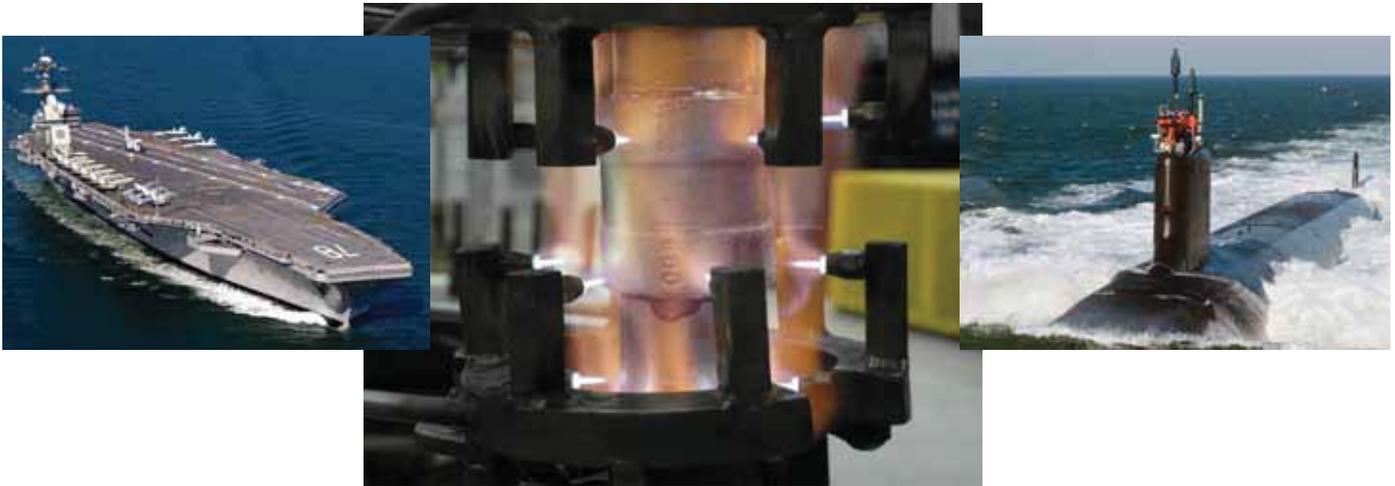
Cost savings of \$1.5M/year in quality assurance and rework



ManTech Reduces Shipbuilding Costs with Alternative Flame Brazing Technology

The Challenge:

Numerous fittings must be manually flame brazed using a hand-held torch during CVN Class aircraft carrier and VIRGINIA Class submarine (VCS) construction and repair. The process is labor-intensive and can result in occasional paint damage and pipe leaks. The rework required is time-consuming and costly.



Shipbuilding costs are reduced by brazing pipe joints shipboard with a small, lightweight heating system as opposed to the current method of torch brazing.

ManTech Response:

- Developed a portable flame brazing system using a programmable logic controller, mass flow controllers, and a burner that surrounds the fitting
- Generating the brazing procedures for shipyard implementation
- Navy ManTech investment of \$1.1M

Impact:

- Reduced the time required to braze each joint
- Decreased the need for rework
- Reduced pipe fitter training time
- Result is production cost savings
- Direct impact on CVN & VCS with applicability to other ship platforms

Estimated cost savings of \$2.3M



ManTech Reduces Costs and Increases Reliability of Extruded Seals for F-35 and F-22

The Challenge:

Both the F-35 and F-22 require approximately 3,000 feet of various shaped seals per aircraft, that are installed around frequently-accessed maintenance panels. For the F-35, the current process cycle includes a significant amount of touch labor required to assemble the mold, inject, disassemble and de-mold the part.



ManTech Response:

- Air Force ManTech and AFRL/RXP worked with two contractors to develop a thermoplastic extrusion process to implement extruded seals with the same filler material used in F-35 cast seals
- Air Force ManTech helped the F-22 program improve their extruded material formulation based on the F-35's extruded seals
- Developed and validated a joint qualification matrix for both F-35 and F-22 programs while both programs worked to qualify the material for implementation
- Air Force ManTech invested \$2.45M

Impact:

- Increased the F-35 production rate and reduced cost by elimination of touch labor
- Reduced F-35 production tooling by 97%
- Increases F-35 seal production rate on an order of one foot per minute compared to the cast process of one foot per hour
- New extruded material for F-22 will have superior durability compared to baseline material, resulting in lower maintenance costs
- Tasks added to program for the production of F-35 tape will result in future production cost avoidance of an additional \$100M

Expected total cost avoidance of \$881M for extruded seals



ManTech Improves Durability and Comfort of Prosthetics and Orthotics for Wounded Warriors

The Challenge:

In the current engagement, more Warriors are surviving injuries and living with amputations. Our military care system is strained by the increased numbers of amputations, and by the functional demands to which our young Warriors want to be restored. New opportunities are available to improve the processing and manufacturing of prosthetic systems to increase durability and comfort and to provide medical personnel the tools to care for our most deserving heroes.

Improved prosthetics braiding automation enables wounded Warriors to return to an active lifestyle



ManTech Response:

- DMS&T partnered with the Office of Naval Research (ONR) to dramatically improve the quality and comfort of sockets for lower-extremity prosthetic systems
- New production approaches were devised to include:
 - Development of new sensor materials to measure pressure on the residual limb from the socket
 - Implementation of a recently-developed 3D digital model system to advance prosthetic design manufacturing
 - An automated production technique to quickly braid the socket and to eliminate hand labor
- ManTech transitioned improved prosthetic technology to prosthetic component fabrication houses and the sensor materials to clinical and research facilities
- DMS&T investment of \$2.814M

Impact:

- 50% lighter, more comfortable sockets
- 40% cost savings over traditional methods using automated braider
- Faster production enables military prosthetists to spend more time on patient care and less time on socket production
- Longer socket service life leads to lower lifecycle costs

Improved prosthetics restore Warrior's quality of life



The MIBP and Its Role in ManTech and the JDMTP

FY11 National Defense Authorization Act Establishes New Position

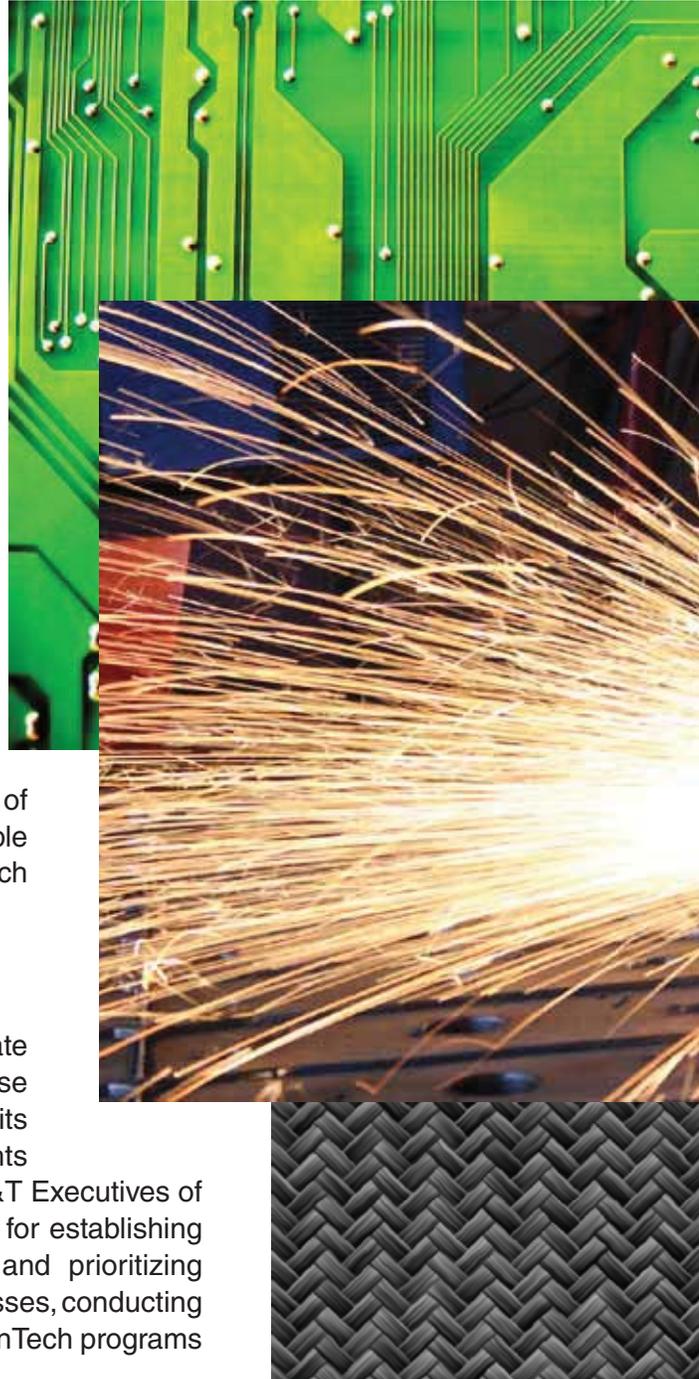
To ensure responsiveness to the Department's current and future industrial base needs, the 2011 National Defense Authorization Act (NDAA) established the position of Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy (MIBP), and Mr. Brett Lambert was appointed to this position. Integrating responsibilities for intensive assessment, industry engagement, and joint investments in manufacturing innovation, MIBP provides a holistic approach to defense supply chain health.

DoD ManTech Makes a Move

As part of the NDAA, the Defense ManTech office was realigned within the Office of the Secretary of Defense (OSD) and now reports to the Deputy Assistant Secretary of Defense for MIBP while maintaining close working relationships with its previous parent organization, the Office of the Assistant Secretary of Defense for Research and Engineering. In its new office, ManTech provides an essential factory-floor perspective, complementing MIBP's other missions. With the responsibilities of developing technologies and processes that ensure the affordable and timely production and sustainment of defense systems, ManTech is a pivotal tool for MIBP and the Department.

JDMTP Continues Its Joint Coordination

The DoD ManTech Program continues to actively coordinate component program activities through the Joint Defense Manufacturing Technology Panel (JDMTP) that derives its responsibilities from Title 10 (United States Code) and represents the interests of the Office of the Secretary of Defense and the S&T Executives of the Army, Navy, Air Force, and DLA. The JDMTP is responsible for establishing a process to effectively transition technology by identifying and prioritizing requirements for advanced manufacturing technologies and processes, conducting joint program planning, and developing joint strategies for the ManTech programs of the Army, Navy, Air Force, DLA and OSD.



JDMTP Subpanel Technology Portfolios

What About the Subpanels?

There are now four JDMTP Subpanels that review the projects within their respective technology portfolios, identify opportunities for collaboration, and provide input to the Principals on opportunities for future investment areas.

METALS

The Metals Subpanel focuses on processing and fabrication technologies in the area of metals, ceramics, optical materials, certain metal matrix composites, ceramic matrix composites, and other materials of similar microstructure.

ELECTRONICS

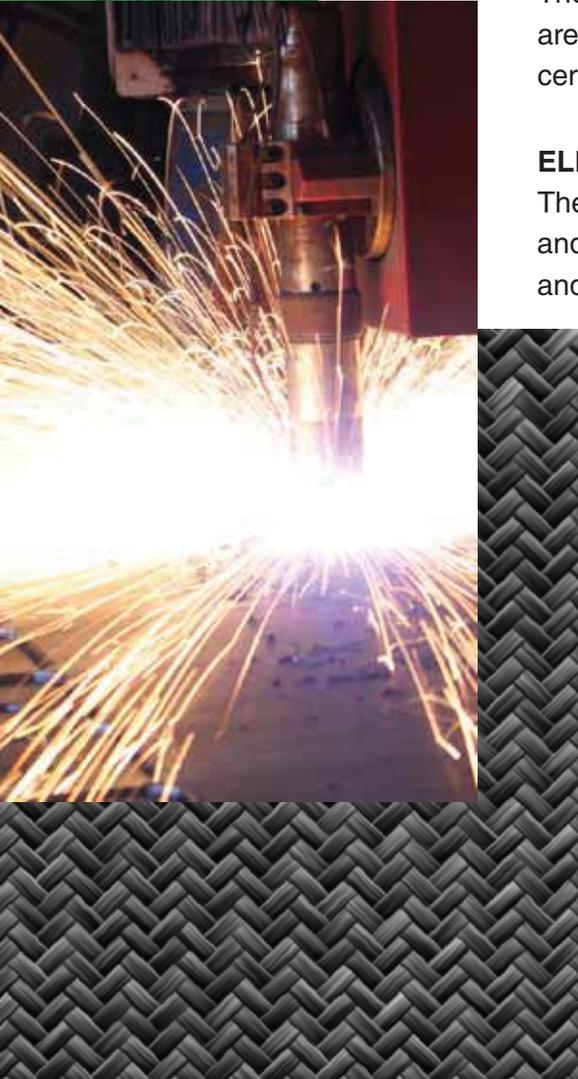
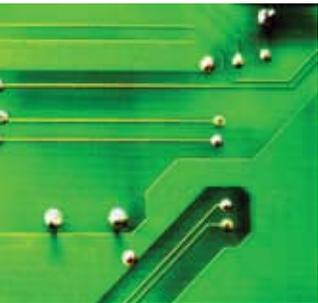
The Electronics Subpanel focuses on manufacturing for electronics packaging and assembly, electro-optics technologies, RF module technologies, power and energy sources, directed energy technologies, electromagnetic windows and domes, and lead free electronics.

COMPOSITES

The Composites Processing and Fabrication Subpanel focuses on the manufacturing and related technologies for the fabrication of parts and assemblies from composite materials, including polymer matrix composites (PMC), ceramic matrix composites (CMC), metal matrix composites (MMC), carbon matrix composites, and other materials that have similar forms and/or use similar processes.

AME

The Advanced Manufacturing Enterprise Subpanel focuses on “above the shop floor” technologies and intelligent business practices that enable new ways of doing business. The AME Sub-Panel purview encompasses the technologies, processes, and practices that foster rapid, effective assembly and superior execution of manufacturing enterprises across the life cycle. It involves a highly collaborative manufacturing environment among the multiple players in system development and production.



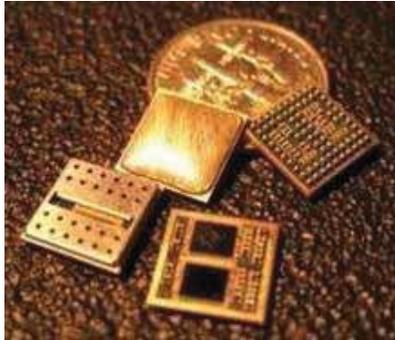


THRUST ONE PROCESSING & FABRICATION

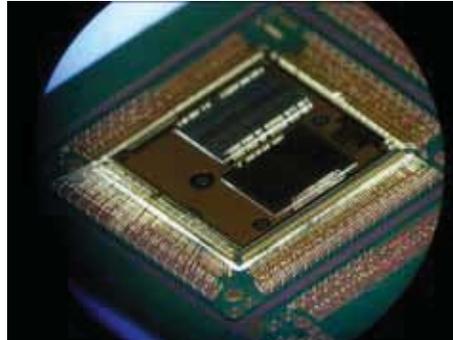
ManTech Improves GPS Usage Opportunities to Enhance Performance

The Challenge:

Global Positioning System (GPS) receiver electronics modules are too large to incorporate into smaller weapons platforms. Size constraints lead to waivers to allow commercial GPS usage. Multiple military systems are failing to benefit from existing GPS capabilities.



RF module



*In-process image
of a GPS module*

ManTech Response:

- DMS&T partnered with the American Competitiveness Institute (ACI) and Rockwell Collins to apply state-of-the-art microelectronics manufacturing and integration techniques to significantly reduce the size of GPS components
- Repackaged circuit functionality into Radio Frequency (RF) and GPS modules
- Leveraged other planned efforts for the use of Application-Specific Integrated Circuits
- Linked emerging military applications (e.g., Unmanned Aerial Vehicles) more closely with state-of-the-art commercial handheld / mobile electronics
- Incorporated an RF module (with military code processing capabilities) into a Modernized GPS User Equipment-embedded product for a technical demonstration planned for FY12 / Q1
- DMS&T total investment of \$3.255M

Impact:

- Completed the Ground-Based GPS Receiver Application Module (GB-GRAM), demonstrating full performance and exceeding Class 2 reliability requirements
- Applied design advancements of 3D chip stacking and micro-passive components (resistors, capacitors) to allow denser circuit layouts for the GB-GRAM Type II (a 20.5% surface area reduction)
- Inserted a GPS module into MicroGRAM (GPS receiver), enhancing situational awareness capabilities
- Integrated a GPS module into a guidance system with anti-jam capabilities to improve performance

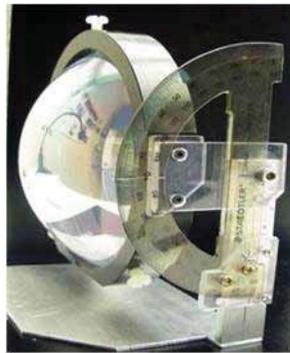
Effective performance through increased use of GPS in military systems



ManTech Delivers Affordable Missile Seeker Domes

The Challenge:

The JAGM (Joint Air-to-Ground Missile) is to replace the TOW, HELLFIRE and MAVRICK with planned production in the thousands by the Army and Marine Corps alone. The preferred material for long wave infrared missile seeker domes is zinc sulfide, but current processes involve hot isostatic pressing techniques and coating methods that are prohibitively expensive and time consuming to produce.



ManTech Response:

- An Army ManTech effort optimized the growth and processing parameters for zinc-sulfide, specifically to produce material with better optical transmission and reduced cost
- Army ManTech investment was \$8M, with \$300K of S&T leveraged funding

Impact:

- Demonstrated a stronger, more affordable missile seeker dome that meets transmission requirements for both infrared and semi-active laser systems
- Improved yield from 70% to 95% for zinc sulfide missile seeker domes
- Reduced unit cost **by 68%** (\$12K to \$3.8K)
- Transitioned to the Army's Joint Air-to-Ground Missile program, and the Navy's Small Diameter Bomb II program

Cost benefit of \$155.8M with an ROI of 19 to 1



ManTech Reducing VIRGINIA Class Submarine Costs with Process Reengineering

The Challenge:

Pipe manufacturing activities represent approximately 4% of the total per hull cost of VIRGINIA Class submarines (VCS). Reducing manufacturing span times and the direct and support costs associated with pipe detail fabrication supports Block III VCS production at the accelerated rate of two VCS hulls per year.



Reducing VCS costs by reengineering pipe shops



ManTech Response:

- Identified and classified pipe detail deliverables into specific classes based upon common manufacturing and assembly characteristics
- Product families assigned to specific work centers and process lanes to streamline pipe detail fabrication
- Identified equipment and tooling enhancements and developed business rules for the discrete sequencing of joint to joint pipe fit-up and welding to provide pipe fitters and welders with written direction for pipe detail weld sequencing, resulting in maximum usage of semi-automated welding technology
- Developed self-sufficient, cellular work centers and process lanes that support a more efficient product flow through the pipe shop
- Navy ManTech investment of \$1.8M

Impact:

- Implementation executed in a phased approach beginning in October 2010
- A reengineered prototype work center for large diameter pipe was fully functioning in January 2011
- Full implementation of manufacturing cells that focus on a specific line of pipe packages/assemblies/details during 2011
- Reduced cost and cycle time

Estimated cost savings \$1.2M per VCS hull



ManTech Leads Castings Industry Transition from Film to Digital Radiographic Inspection for Reduced Cost

The Challenge:

Current radiographic inspection of defense aerospace and weapons castings is expensive and time consuming. The cost of film media used for imaging results has increased 9-20% per year for the last five years. Digital radiography is now widely available as a more affordable in-house inspection tool for metalcasting quality assessment, however, digital reference standards must be established to certify parts using this new technology.



ManTech Response:

- DLA ManTech, Air Force ManTech and the Air Force Metals Affordability Initiative established teams with OEM, supplier and equipment vendor participation (including the American Metalcasting Consortium), to pave the way for Digital Radiography and to develop and gain acceptance of ASTM digital reference radiographic standards
- Air Force ManTech established digital equivalency to film by conducting Probability of Detection (POD) studies at each casting supplier
- Air Force ManTech developed a guidelines document for digital radiography use that was supported by aerospace castings suppliers and OEMs and submitted to ASTM for balloting
- Digital radiographic standards developed include cast titanium standard (E2669) for aerospace, cast aluminum (E2422) and investment cast steel (E2660)
- Air Force ManTech, Air Force Metals Affordability Initiative, and DLA ManTech invested \$3.2M total with an industry cost share of \$834K

Impact:

- Eliminates cost of film processing and storage that can be 5% of the total cost of the casting (\$2/film sheet x 157 sheets = \$314 in film for a single part)
- Reduced radiographic inspection times by as much as 90% (~12 minutes versus 2-3 hours)
- Increased probability of detecting flaws from 85% to 97%
- Inspection data now stored electronically and digital standard guidelines available via ASTM

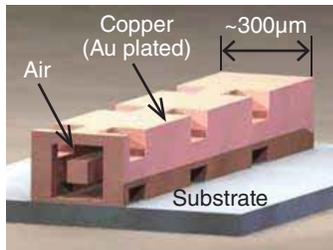
Saves \$2M/year in radiographic inspection cost for DoD components



Micro Components Developed for Next-Generation Jammer and Munitions

The Challenge:

System requirements for microwave-based devices are increasing in operational frequencies and power, while decreasing in size and cost. Traditional microwave circuit board manufacturing methods cannot scale to these new frequency and power levels in small, lightweight packages.



*PolyStrata Recta-Coax
all copper air-dielectric
transmission line*

*PolyStrata frequency
scanned antenna*



*PolyStrata Ka band
power amp prototype*



EA-18G with jammer pods

ManTech Response:

- Implemented the PolyStrata[®] microfabrication process associated with sophisticated integrated microwave circuits and metallic components to satisfy surge requirements for EW and safety and arming mechanisms for munitions
- Nuvotronics team designed and executed experiments to increase yield and reduce cost by:
 - Optimizing the photopolymer processing
 - Revising the planarization chemistry and process
 - Improving electroplating speed and uniformity
- Nuvotronics is working to transition microwave components to EA-18G Growler Next Generation Jammer and safety and arming device for medium caliber munitions

Impact:

- 2-3X improvement in mechanical tolerances
- 300% increase in throughput
- Increased component performance in both frequency (from 5:1 to Super-Broadband of 1000:1) and power (from low to 400 W/m²K) with reduced size and weight
- Improved batch manufacturing by increasing yield by at least 50%
- Up to 68% cost savings in produced components

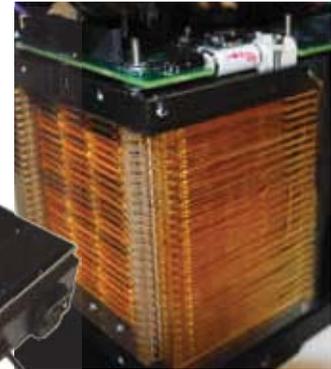
IBIF Investment of \$998K and Industry Investment of \$550K



Fuel Cell Production Capability Increased to Meet Surge Requirements at Lower Cost

The Challenge:

When Air Force teams provide aero-medical evacuation services to our military and civilian personnel, they often require large and cumbersome avionics frequency converters and electrical extension cord systems to provide power from the aircraft to the medical equipment used during patient transport. Patients become “tethered” to the aircraft power systems with no simple method for patient transfer.



Fuel cell

PEPSAE unit

ManTech Response:

- Reduced the cost of the Portable Electrical Power System for Aero-medical Evacuation (PEPSAE) by creating an improved, surge-capable fuel cell production line
- Jadoo Power made improvements in component tooling, reduced the cost of parts, improved assembly and testing processes, increased throughput and decreased labor costs
- New production line may also be used for other military fuel cell applications such as tactical radios, unmanned aerial vehicles, unmanned ground vehicles, sensors

Impact:

- Reduced unit cost of PEPSAE application by 56% from \$29,644 to \$13,037
- Decreased lead time from 22 weeks to 10 weeks
- Improved first pass yields **from 60% to 98%**
- Resulting production line will increase throughput to meet surge requirements and improve quality assurance and acceptance practices

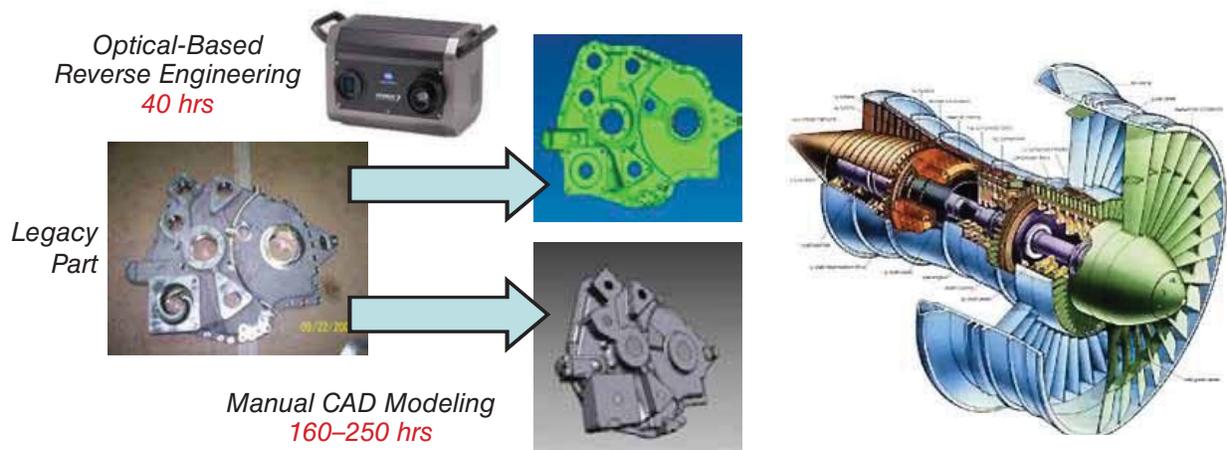
IBIF Investment of \$993,902



ManTech Reduces Cost for the Preservation and Manufacturing of Legacy Components

The Challenge:

As the military works to maintain and repair its legacy systems, 3-D design models are required to be able to produce and replace aging components using today's modern manufacturing facilities. Affordable modeling techniques are needed to create 3-D models for components that no longer have design data and to convert existing 2-D drawings into 3-D models, an expensive and difficult task for complex parts for which old drawings may be inaccurate after years of design changes.



ManTech Response:

- Rolls-Royce leveraged a previous Army ManTech program to develop a methodology for reverse engineering legacy parts using a variety of optical scanning techniques
- An integrated product team was established including experts in design, manufacturing engineering, quality engineering, Product Life-cycle Management (PLM), and scanning
- CAD model generated from scanned point cloud was verified and validated using a standard framework of generalized rules and tools

Impact:

- Reduced time required to create CAD models up to 75%
- Converted legacy parts are PLM-compatible
- Allows DLA and DoD suppliers to meet surge production requirements and minimize lead time
- Provides the Warfighter with critical spare parts for legacy weapons systems

IBIF Investment of \$844K

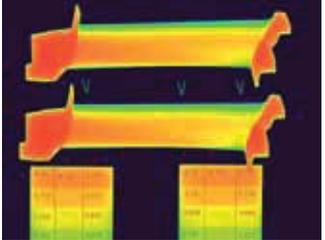
DoD ManTech - Did You Know?

- DoD ManTech developed the original numerically controlled machine tool and the associated programming language, APT, in the 1950's to advance military aircraft manufacturing. Now used globally in countless manufacturing applications.
- The DoD ManTech program developed the technology that became the foundation for the current microelectronics industry in the 1960's.
- In the 1970's, DoD ManTech developed processes for the production of the forerunners of precision laser guided missiles and munitions.
- In the 1980's, DoD ManTech developed a process for reverse engineering thousands of obsolete microcircuits that support weapon systems still in service. Use and mission benefits continue to expand today.
- In the 1990's, the DoD ManTech program developed magneto-rheological finishing for advanced military optics. The process is now also used by all manufacturers of photolithographic optics.
- In the current decade, DoD ManTech:
 - Provided revolutionary electronics such as Micro Electro-Mechanical Systems (MEMS) for field artillery systems and Focal Plane Arrays (FPAs) for sensor systems
 - Enabled manufacturing of interceptor body armor currently used by our forces
 - Manufactured next generation of enhanced combat helmets to replace 30-year old technology
 - Developed automated processes for lighter, durable and more comfortable composite prosthetics
 - Provided improved combat rations with high quality, safer, and surge-capable production
 - Implemented higher power, longer duration batteries across weapon systems
 - Applied model-based manufacturing and CAD in aeronautical and maritime construction for greater affordability

2011 Defense ManTech Achievement Award Nominations

There were 7 nominations submitted through JDMTP Subpanels for the 2011 Defense ManTech Achievement Award. The awardees were announced at the Defense Manufacturing Conference.

The JDMTP Principals would like to recognize these nominees for their efforts.

Project Title	Service	
* Low Cost Zinc Sulfide Missile Dome	Army	
Optimizing Corrosion Resistance of Super Austenitic Stainless Steel Castings and Welds	DLA	
Customer Driven Uniform Manufacture: Item Level RFID Technology for the Combat Uniform Supply Chain	DLA	
* Use of Digital Radiography for Final Part Acceptance of Aerospace Castings	DLA & AF	
Improved Advanced Watertight Closures for Surface Ships	Navy	
CH-47 Composite Tunnel Cover for Aviation Composite Structures Program	Army	
* Prosthetics & Orthotics Manufacturing Initiative (POMI)	Navy & DMS&T	
* 50 to 300 Watt Fuel Cell Auxiliary Power Unit (ACU) and Battery Charger	DMS&T	
Grenade Initiation Module (GIM)	Army	
* Automated Fiber Placement of Carbon Fiber Bismaleimide Materials	Navy	

* *Finalist*

The Joint Defense Manufacturing Technology Panel (JDMTP) seeks to recognize and honor those individuals most responsible for outstanding technical accomplishments in achieving the vision of the Department of Defense (DoD) ManTech Program. That vision is to realize:

“A responsive world-class manufacturing capability to affordably and rapidly meet Warfighter needs throughout the defense system life cycle.”

To this end, the Defense Manufacturing Technology Achievement Award was established in the Fall of 1999.

AWARDEES

- | | |
|---|---|
| 2010 – High Power, High Energy Density Lithium-Ion Batteries | 2006 – Engine Rotor Life Extension |
| 2010 – Seal Extrusion Development and Demonstration (SEDD) | 2005 – Large Aircraft Infrared Countermeasures |
| 2010 – Weld Seam Facing and Back Gouging | 2005 – Large Marine Composite-to-Steel Adhesive Joints |
| 2009 – F-35 Inlet Duct Robotic Drilling | 2004 – Lean Depot Repair |
| 2009 – Low Cost Manufacturing of Materials for Improved Warfighter Protection | 2004 – Uniform Cannon Tube Reshaping |
| 2008 – Laser-Welded Corrugated-Core (LASCOR) Panel Evaluation | 2003 – Laser Additive Manufacturing |
| 2008 – Low Observable Paints for Aircraft | 2003 – Laser Shock Peening |
| 2007 – Lean Battery Initiative | 2002 – Composites Affordability Initiative |
| 2007 – Low Cost SiC-N Ceramic Tile | 2002 – Apparel Research Network |
| 2007 – Translational Friction Stir Welding | 2001 – Enhanced Mfg. Processes for Body Armor |
| 2006 – Uncooled Focal Plane Array Producibility | 2000 – Advanced Optics Manufacturing |
| | 2000 – Flexible Manufacturing of Microwave Vacuum Devices |
| | 1999 – Advanced Fiber Placement |



For Further Information
www.dodmantech.com

