Introduction

Who

What

Where

When

Why

The

of U.S. Army ManTech
**Mission:** To reduce the risk of transitioning critical technologies to warfighter and weapon system platforms through affordable and timely manufacturing solutions that address the highest priority needs of the Army.

**Strategy:** Identify and invest in manufacturing processes that enable the transition and fielding of *producible*, *reliable*, and *affordable* technologies for Army systems.

**Management:** The DASA(R&T) oversees the Army ManTech Program. The U.S. Army Research, Development and Engineering Command (RDECOM) provides program management.

**Execution:** Projects are competitively awarded to and executed by Army Commands/Labs or PEO organizations with industry participation.
Army Labs Execute the Majority of Early RDT&E Funding
6.1 – Basic Research
6.2 – Applied Research
6.3 – Advanced Technology Development
   Limited 6.4, 6.6, & 6.7 Funding

PEOs Execute the Majority of Later RDT&E Funding
6.4 – Adv. Component Development and Prototypes
6.5 – System Development and Demonstration
6.6 – RDT&E Management Support
6.7 – Operational System Development

TRL6 ⇒ TRL8/9

~RIVER OF TRANSITION~

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U.S. Army Top Priorities & AMC Initiatives

Current Fight (Now – 2025)  Future Fight (Mid-Term 2026 – 2035 & Long-Term 2036 – 2050)

Top U.S. Army Priorities

Army Material Command (AMC) Initiatives

- Army-wide Sustainment
- Materiel Development
- Materiel Readiness
- Sustainable Readiness
- Force Projection
- Battlefield Sustainment

Chief of Staff

Army Material Command
& Commanding General

Secretary Army

AMC Operationalizes its Essential Functions at the Tactical, Operational, and Strategic Levels to Assure Sustainable Readiness

AMC Ensures Logistics Corps Soldiers and the Civilian Workforce are Trained and Ready to Execute Doctrinal and Directed Missions in Support of Army Priorities and Missions

AMC is Postured at Echelon to Synchronize and Integrate S&T and R&D to Defeat Any Adversary

- Shape Army sustainment to best meet Army readiness requirements.
- Ensure combat service support unit readiness through Manning, training, and equipping.
- Support acquisition life cycle by providing sustainable materiel solutions.
- Leverage science and technology/research and development to maintain the competitive edge.
- Synchronize and integrate the supply chain.
- Divest excess Army equipment and improve equipment on hand.
- Optimize organic industrial base to meet Army equipping needs.
- Receive, store and issue munitions in support of wartime requirements.
- Optimize end-to-end ... fort to port ... port to port ... port to foxhole.
- Configure Army prepositioned stocks to assure rapid, sufficient and capable land power.
- Provide contracting solutions to deliver operational support.
- Build partner capacity through security assistance programs.
- Synchronize & integrate AMC’s strategic capabilities to the battlefield.
Priorities & Investment Areas

TRADOC
S&T Imperatives & Warfighting Challenges

OVRMACX
Overmatch & Soldier Systems –
Future Vertical Lift –
Robotics/Autonomy –
Mission Command –
Advanced Protection Systems –
Combat Vehicles –
Cross-Domain Fires –

Prioritized Needs

Army Materiel Command

Research, Development & Engineering Command

Manufacturing Technology PMO

Prioritized Needs

Secretary Army

ASA(ALT)

DASA (R&T) Portfolios
– Ground Maneuver
– Lethality
– C3I
– Air Systems
– Soldier/Squad
– Innovation Enablers
– Medical Systems

Chief of Staff

RDECOM S&T Priorities
– Armor
– Additive Manufacturing
– Future Vertical Lift
– Aviation Protection
– Technologies to Support Infantry
– Network
– Artificial Intelligence/Autonomy
– Robotics
– Cyber/Electronic Warfare
– New Combat Fighting Vehicle
– Assured Position, Navigation & Timing

03 May 2017

Focus Investment Areas

- **Innovation Enablers** – improved resilience & fielding times via emerging technologies, e.g. additive mfg., model based enterprises.
- **Lethality** – improved offensive and defensive kinetic and directed energy systems; energetic materials, munitions, related systems.
- **Air Systems** – improved survivability and maneuverability; reduced costs & weight; payloads, engines, UAVs, and related systems.
- **Command, Control, Communications and Intelligence (C3I)** – addresses improvements in sensors and supporting systems; radar device technology manufacturing; measuring or detection devices and electronic components to reduce SWaP & cooling.
- **Medical Systems** – infectious disease countermeasures, combat casualty care, chemical/biological defense, and related.
- **Soldier/Squad** – reduce loads; improved electronics SWaP, improved protective gear, e.g. body armor, helmets, apparel, etc.
- **Ground Maneuver** – reduced cost and weight, improved maneuverability and survivability; improved power and energy systems.
Performing Organizations

U.S. Army Manufacturing Technology PMO

Proposed Solutions

Army Research Laboratory
Armament Research, Development & Engineering Center
Aviation & Missile Research, Development & Engineering Center
Communications-Electronics Research, Development & Engineering Center
Edgewood Chemical Biological Center
Natick Soldier Research, Development & Engineering Center
Tank Automotive Research, Development & Engineering Center

Growing Interest from:

Medical Research & Material Command
Space & Missile Defense Technical Center

67% of Eligible Organizations are Actively Participating
### Portfolios & Performing Organizations

- **33 Projects Executing FY17 Funding**
  - 10 Performing Organizations
- See the FY17 Army ManTech brochure for more information www.armymantech.com

### ManTech FY17 Focus Investment Areas

<table>
<thead>
<tr>
<th>Air Systems</th>
<th>Ground Maneuver</th>
<th>Lethality</th>
<th>Innovation Enablers</th>
<th>Soldier Squad</th>
<th>Medical Systems</th>
<th>C3I Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.7%</td>
<td>26.1%</td>
<td>17.6%</td>
<td>13.1%</td>
<td>5.9%</td>
<td>1.7%</td>
<td>28.8%</td>
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<tr>
<td>Fuel Bladders</td>
<td>Lt. Wt. Armor &amp; Structures</td>
<td>Rocket Motor Nozzles</td>
<td>Additive Mfg.</td>
<td>PE Protection</td>
<td>Vaccine Production</td>
<td>SW MW LW IR FPAs &amp; Imagers</td>
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<tr>
<td>AH-64 Sump</td>
<td>Low Sig. Coatings</td>
<td>Penetrators</td>
<td>Cold Spray</td>
<td>Shelters</td>
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<td>Uncooled IR</td>
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<td></td>
<td>6T Mil. Batt.</td>
<td>Gun/Canon Barrel Mfg.</td>
<td>VR Smart Machining</td>
<td>Eyepieces</td>
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<td>Antennas</td>
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<tr>
<td></td>
<td>Adv. PTO</td>
<td>Ammunition</td>
<td></td>
<td>Sighting Sys.</td>
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<td>Radar</td>
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<tr>
<td></td>
<td>Mg Mfg. Tech</td>
<td>Grenades</td>
<td></td>
<td></td>
<td></td>
<td>Affordability</td>
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<td></td>
<td>Li Ion Tech</td>
<td>MMIC Mfg. Tech for AD</td>
<td></td>
<td></td>
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<td>Flexible III-V Solar Cells</td>
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</tbody>
</table>

![Chart showing FY17 Funding Allocation by Organization]

**ARL 27%**
**TARDEC 10%**
**CERDEC 26%**
**AMRDEC 15%**
**PEO Soldier 2%**
**MRMC 2%**
**PEO Aviation 2%**
**NSRDEC 1%**
ManTech Program Annual Timeline

Balances/Aligns Portfolio with the S&T, PEO, & PM Organizations and the Priorities of the Army

<table>
<thead>
<tr>
<th>4Q FY1</th>
<th>1Q-2Q FY2</th>
<th>3Q FY2</th>
<th>4Q FY2</th>
<th>1Q FY4</th>
<th>4Q FY3</th>
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<tbody>
<tr>
<td>Investment Guidance</td>
<td>Strategic Input</td>
<td>Project Definition</td>
<td>Assess and Prioritize</td>
<td>Approval for Programming</td>
<td>Approval for Planning</td>
</tr>
</tbody>
</table>

*Stakeholders include ASA(ALT), AMC, S&T Organizations, & PEOs/PMs

Project Selection Criteria
- Alignment with Requirements
- Cost Benefits
- Technology Benefits
- Transition Planning
- Implementation Planning
- Pervasiveness
Examples of Success Stories

Lightweight Soldier Protection
• **Challenge:** Production of PE material with consistent and controlled properties to reduce weight of Soldier protection equipment.
• **ManTech Solution:** Demonstrated novel ultra-strong low cost film manufacturing technology for superior warfighter protection enabling increased warfighter mobility and survivability.

Improved Focal Plane Arrays
• **Challenge:** Consistent manufacturability of 4-inch diameter (III-V) GaSb substrates for dual band IR detectors (demonstrated but not repeatable).
• **ManTech Solution:** Established a horizontal integration model with trusted entities to mature manufacturing and enable affordable system level testing and integration for 3rd Gen FLIR B-Kits.

Additive Manufacturing
• **Challenge:** Integration of additive manufacturing capabilities to demonstrate rapid prototyping of functioning systems.
• **ManTech Solution:** Manufactured M320 training grenades and a 40mm grenade launcher using additive manufacturing processes and materials to demonstrate current capabilities. Supports PEO AMMO, PEO Soldier, Joint Service Small Arms Program and SOCOM.
**Project Transition Examples**

**Lightweight and Survivable Combat Vehicle Structures**
- Developed processing techniques to demonstrate single piece under body structures – blast tested to 5X; results informing TRADOC MCoE survivability requirements generation.
- Reduced cost by 30% for 3D weave & ceramic armor tile enabling affordable higher-performing solutions for tactical wheeled vehicles.

**Ceramic Matrix Composite (CMC) Engine Components**
- Improved manufacturing processes of CMCs for new capabilities
  - Validated process capabilities to MRL 6+.
  - Anticipated fuel savings of ~0.5% improvement in engine SFC with >1 pound of weight reduction (per engine).
- Transitioned to industry production operations to produce LEAP commercial engines as well as on Navy T-700 engine program.
- Enabled affordable CMCs for GE ITEP turbine engine design.

**Improved Processes for Insensitive Munitions**
- Reduced cost from $30 per pound to less than $20 per pound for solventless propellant for an overall cost benefit of $6M from a $2.6M investment.
- Transitioned to Radford Army Ammunition Plant for implementation through a $400M facility modernization plan.
- Improved insensitive munitions reduces the hazard level resulting in fewer injuries and lives lost per incident.

**Digital Low-Light Level Sensors**
- Transformed aviation vision systems by replacing image intensifier tubes with affordable high-performance low-light digital sensors.
- Improved manufacturing process from MRL 5 to MRL 7.
- Increased production yield >200%, reliability by >300%, and reduced unit cost by 75% (from $24,600 to $5,600).
- Transitioned to PM Apache for production and fielding to 1st Battalion, 82nd Combat Aviation Brigade - Feedback received from pilots regarding performance and reliability has been excellent.
Engagement Opportunities

Defense Manufacturing Conference

- Currently investigating holding a session to describe the latest priorities, needs and requirements of the Army.

- Followed by individual 15-minute face-to-face meetings with Army representatives from the different R&D and acquisition organizations.

- Opportunity to directly engage with ManTech project officers and managers working on high-priority Army manufacturing problems.
Questions?