AVIATION WEEK
MILITARY AVIATION LOGISTICS AND MAINTENANCE
SYMPOSIUM

Military Sustainment (OIB): Strategy & Modernization

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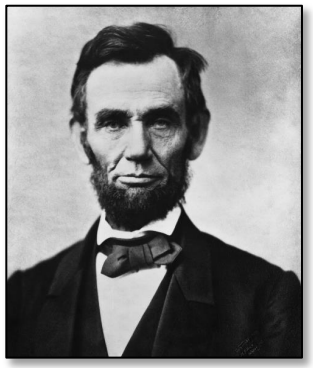
Avathon

AVIATION WEEK NETWORK


U.S. ARMY
ROCK ISLAND ARSENAL JOINT MANUFACTURING & TECHNOLOGY CENTER
ROCK ISLAND ARSENAL-
JOINT MANUFACTURING AND
TECHNOLOGY CENTER
As of 7 Jan 2025

JOINT MANUFACTURING AND TECHNOLOGY CENTER
Our History



An Act of Congress
The United States acquired the title to Rock Island in 1804 through a treaty with the Sauk and Meskwaki tribes. The importance of the island was identified as early as 1809, when it was set aside as a federal military reservation by an Act of Congress, signed by President Abraham Lincoln on July 11, 1862.

Post Civil War Era
The Chief of Ordnance ordered Rock Island Arsenal (RIA) to begin manufacturing infantry and cavalry equipment on July 19, 1875.

Spanish American War Era
During the Spanish-American War, RIA provided implements and equipment for batteries using the 5-inch and 7-inch siege guns.

World War I Era
RIA produced America's first tanks. Mark VIII tanks, also known as Liberty tanks, were assembled from available components. Based on a British design, they were modified for Browning machine guns and Liberty engines. The last of these tanks were completed on June 5,1920. In September of 1916, the decision was made to once again produce the Model 1903. The Model 1903 rifle was one of two primary weapons issued to troops during the Great War.

World War II Era
The first Model 1919A4 .30 caliber Browning machine gun was completed on October 11, 1941. During the war, RIA produced nearly 85,000 machine guns. Model 1919A5 and Model 1917A1 machine guns were also manufactured.

JOINT MANUFACTURING AND TECHNOLOGY CENTER
Mission & Vision

MISSION

Develop, manufacture and deliver readiness solutions through conventional and advanced manufacturing processes for the U.S. Army and Department of Defense systems globally.

VISION

Produce high quality and on-time readiness solutions to the Warfighter while modernizing to support the next fight.

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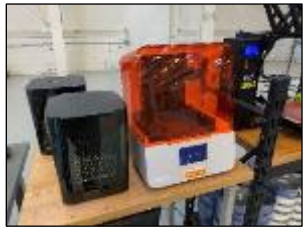
Equipment at the Center of Excellence

HP 4200
Multi-Jet Fusion
Polymer
High Volume Production Printed Parts

Stratasys 900MC
Fused Deposition Modeling (FDM)
Polymer Filament-Based Printing
Large Envelope & Precise

Lulzbot Taz 6
Fused Deposition Modeling (FDM)
Polymer Filament-Based Printing
Inexpensive, Durable, Versatile



Formlabs Form 3
Stereolithography (SLA)
Polymer Resin-Based Printing.
Versatile Material Choices: Clear, Flexible, Durable, Medical

Markforged Suite
Mark 2, X7, Metal X
Fused Deposition Modeling (FDM)
Strong, Precise, Continuous Fiber Reinforcement

ATOS Blue Light Scanner
Reverse Engineering
Digital Inspection
Top of the Line Scanning Equipment

Renishaw AM500Q
Laser Powderbed Fusion
Powder Metal Printing
Industry Standard Precision Metal Printed Parts. AlSi10Mg. Aluminum Alloys.

EOS M290
Laser Powderbed Fusion
Powder Metal Printing
Industry Standard Precision Metal Printed Parts. MS1 & 316L.

3D Systems ProX320
Laser Powderbed Fusion
Powder Metal Printing
Precision Metal Printed Parts, Best printers for Titanium & Nickel Parts

Mazak i400am
Multi-Axis Machining Center with Additive Print Head
Machining & Printing in one package. Repair.

VRC Cold Spray
Gas Coating Deposition
Corrosion protection, repair wear surfaces, maintenance

Jointless Hull
Friction Stir Additive Process
Worlds largest metal additive manufacturing machine. 30'x20'x12'

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JOINT MANUFACTURING AND TECHNOLOGY CENTER
Jointless Hull

- **MACHINE CAPABILITIES:**
  - Volume**:** 20’W x 30’L x 12’H
  - **Materials:** Aluminum, Copper, Nickel, Steel, Titanium

- **PROCESS IMPROVEMENTS:**
  - Hybrid capability to machine 3D metal printed parts without removing part from the print chamber
  - Allows new designs previously unattainable, specifically removing weld joints which will strengthen hulls

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JOINT MANUFACTURING AND TECHNOLOGY CENTER
Center of Excellence for Advanced/Additive Manufacturing

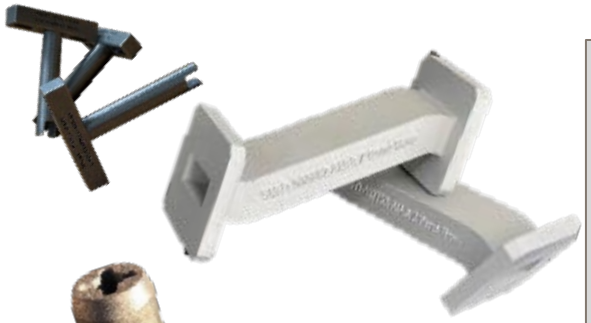
Largest Polymer Build Volume
35.98 in x 23.98 in x 35.98 in
914 mm x 609 mm x 914 mm

Materials:*
ABS
PLA
ULTEM
PC
Nylon
Carbon Fiber
Kevlar
TPU

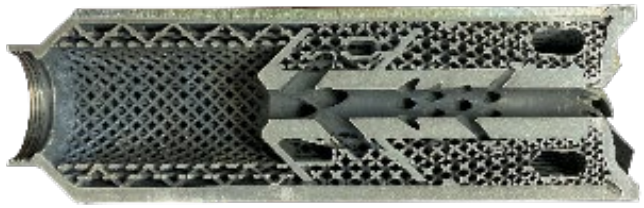
Total Polymer Printers: 20+*
Applications: High volume parts with high quality surface finishes and textures.

* Current Capabilities as of FEB 2025

Largest Metal Build Volume
10.82 in x 10.82 in x 16.5 in
275 mm x 275 mm x 420 mm



Materials:*
Aluminum AlSi10Mg
Ni718
316L Stainless Steel
17-4 Stainless Steel
Maraging Steel MS1
Ti Gr5
Ti64 ELI



Total Metal (LPBF) Printers: 7*

Applications: Reduced weight designs, simplified assemblies, conformal cooling, enhanced fluid flow, topology optimization, mass customization.

JOINT MANUFACTURING AND TECHNOLOGY CENTER

Casting & Forging Current Capabilities

- RIA-JMTC's current castings and forgings capabilities are suited for primarily ground applications and needs to take the initiative to become aligned for alloys used in the aviation industry.
- Strategic actions are needed to begin focusing on the titanium furnace for casting and work to increase our aluminum capability for the future.
- RIA-JMTC is currently working initiatives to obtain a simulation capability for forging as laying the groundwork to add robotics to our hammers.
- Commitment is needed for future expansion on utilization of Magnesium and larger Ti to expand capability for Warfighter readiness for future fights.

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JOINT MANUFACTURING AND TECHNOLOGY CENTER
AS9100 Certification

We are driving towards AS9100 certification because the Department of Defense needs us to! Part of our mission is to supply high quality on time readiness. Our customers have spoken, and they need castings, forgings, and machined parts that are aircraft quality. Commanding General MG Michael Lalor recently stated "Where I did receive questions and asks, was on where vendors and manufacturers could take advantage of our capability at JMTC, and notably with casting/forgings for the aeronautics industry. There is a clear decline now in Aeronautics casting and forging capability. This affects our Army, this affects the joint force, and this provides us an opportunity."

- We have a solid foundation of regulations, standard operating procedures, and desk procedures.
- Currently Partnering with Eagle Force.
  - Eagle Force is a AS9100 consultant and is being utilized for Continuous Process Improvement initiative.
  - They bring a tremendous amount of experience with the AS9100 standard and history working with multiple DoD sites.
  - Achieved AS9100 certification at every site they have consulted

Going forward with partnerships with other DoD agencies is key to our success, team up and get to work for our Warfighter for the future fight.

Center for Industrial & Technical Excellence (CITE)
- Mobile Maintenance Systems
- Add on Armor Prototype, Development & Production
- Foundry Operations

Center of Excellence
- Advanced and Additive Manufacturing

ISO 17025 CERTIFIED | ISO 9001 | 5080 SERIES CERTIFIED | ISO45001 SAFETY CERTIFIED

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JOINT MANUFACTURING AND TECHNOLOGY CENTER
Thick Aluminum Line

RIA-JMTC will be very cost competitive with this modernization effort

- **PROCESS IMPROVEMENTS:**
  - Standardized Raw Material Sizing
  - Over 500-in³/min material removal rate
  - In-Machine Inspection to minimize operational delays
  - Lights-Out Operation up to 50%
- **MODERNIZATION SPIN-OFFS:**
  - Robotic Machining replacement of Waterjets
  - New Roughing Fixture Concept transfer to Existing Boring and Bridge Mills
  - Robotic Material Holding instead of Fixtures
  - Robotic Paint Removal instead of Masking