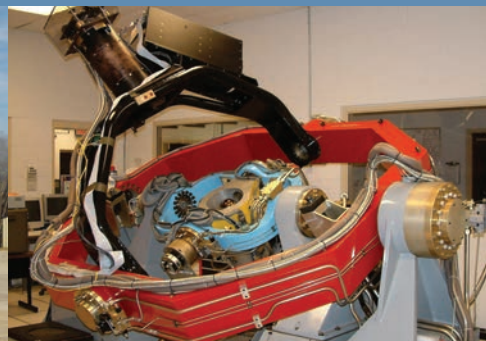




U.S. Army Redstone Test Center

Test Services



Army Proven
Battle Ready

REDSTONE ARSENAL, ALABAMA



Who We Are

The Redstone Test Center (RTC) is a United States Army Test and Evaluation Command (ATEC) tenant activity on Redstone Arsenal. Located near Huntsville, Alabama, Redstone Arsenal currently operates on more than 39,000 acres of land. RTC encompasses over 14,000 of those acres, providing cutting edge test and evaluation support for our customers since the early 1950's. Our strength lies in the highly skilled workforce dedicated to the mission of providing the safest and most effective weapons systems possible to the soldiers in the field.

Our Mission

To Provide Superior Technical Expertise and State-of-the-Art Facilities and Capabilities to Plan, Conduct, Analyze and Report the Results of Tests on Aviation, Missile and Sensor Systems, Subsystems and Components





Supporting the Warfighter

RTC services are provided to ensure the safety, performance and reliability of military hardware and embedded software in their operational environment. To provide best technical results for our customer's dollar, we optimize each test program with the best combination and sequence of testing, modeling and simulation. RTC's state-of-the-art facilities and management processes are designed for rapid reconfiguring to support a wide variety of testing, providing maximum test scheduling flexibility with minimum cost to the customer.

RTC provides lifecycle support to programs from concept formulation through research and development, production and post-production testing helping to ensure top quality systems are provided to the Soldier.



Center Highlights

126,287 Square Foot World Class Rotary Wing Center Providing Lab and Aviation Support Services

Aviation Flight Testing on AH-64 Attack; CH-47 Cargo; Kiowa OH-58D; UH/EH/HH/MH-60 Black Hawks, Fixed Wing, Unmanned Systems

Highly Instrumental Missile and Rocket Test Ranges up to 8.5 km

Sled Test Tracks up to 1900 ft.

Shaped Charge Warhead Detonation Facility

Full Video Editing Facility

Telemetry Design and System Development Laboratory

Fixed and Mobile Telemetry Ground Stations

Precision Gauge Verification and Calibration Facility

Tinius Olsen 400,000 lb. Load Frame

Multi-pass Filter Test Machine

Pump Test Stand

Rocket Motor Dissection up to 50,000 lb. of Propellant

Capable of Simulating Underground Bunkers or Tunnels for Unmanned Ground Vehicles (UGVs), Communication Relay, Confined Space Operations Testing

Hardware-in-the-Loop (HWIL) Facility Designed to Test the Next Generation of Multispectral Guided Missile, Rocket and Munitions System

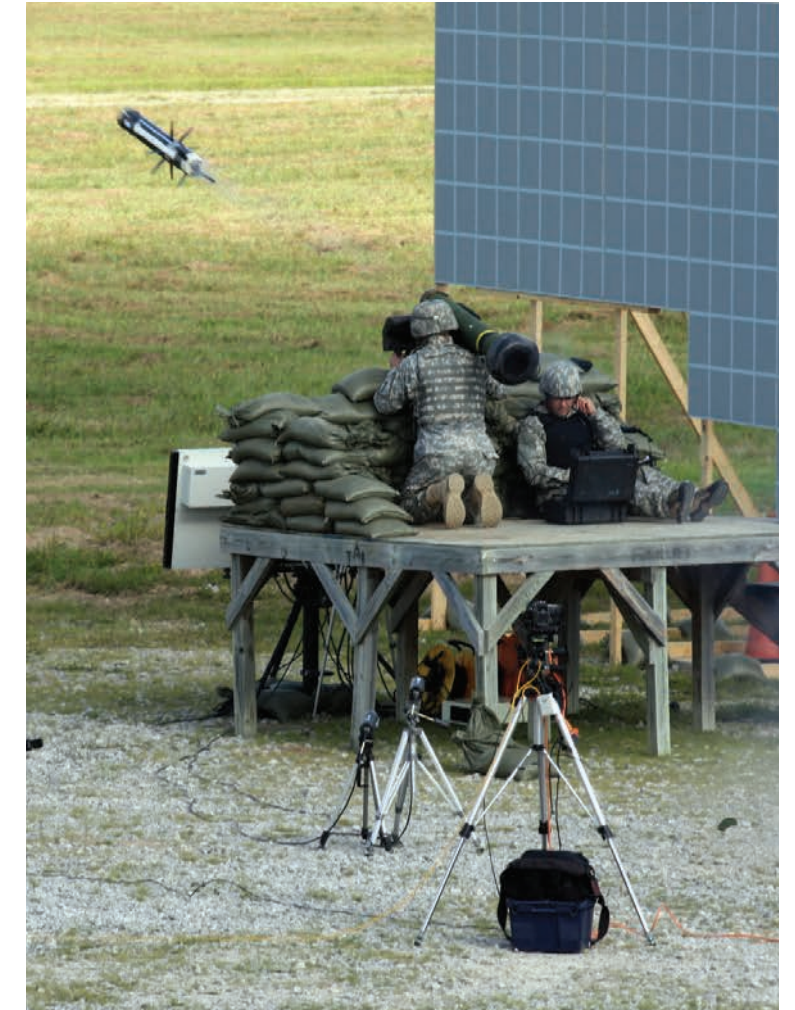
Multiple Test Stands for Solid and Liquid Propellant Motor Static Firings up to 10.0 M-lb. Thrust

Center of Expertise for Testing Lightning's Effects on Explosive and Hazardous Materials

Distributed Test Control Center (DTCC) implementing Secure Defense Research and Engineering Network (SDREN), Defense Research and Engineering Network (DREN), ATEC Test Integration Network (ATIN) and Secure Internet Protocol Router (SIPR) Network Operations Connectivity Supporting Distributed Test Events

Only Army Installation in the Southeast that has an Army R&D Weather Team

Helicopter Icing Spray System (HISS) Utilized for Icing and Water Intrusion Testing



Telemetry & Data Management

Design, Build and Test Custom Telemetry Systems for R&D and Fielded Department of Defense (DoD) Weapon Systems

Maintain and Operate State-of-the-Art Mobile and Fixed Telemetry Ground Station Facilities in Support of Telemetry Data Acquisition on Redstone Arsenal and Elsewhere

Serve as Subject Matter Expert for the Army and DoD in Weapon System Telemetry and Flight Termination Hardware and Application

Serve as Technical Liaison between Instrumentation Research Programs and Actual Army/DoD Weapon System Needs

Missile & Rocket Flight Test

Medium Range Missile Flight Tests

Dynamic Warhead Testing

Small Missile and Rocket Flight Tests

Hit Avoidance/Active Protection System Training



Aviation Flight Test & Weapons Systems Integration

Unmanned Aircraft System (UAS) and Manned-Unmanned Teaming

Aircraft Performance

Targeting/Pilotage Sensors

Handling Qualities

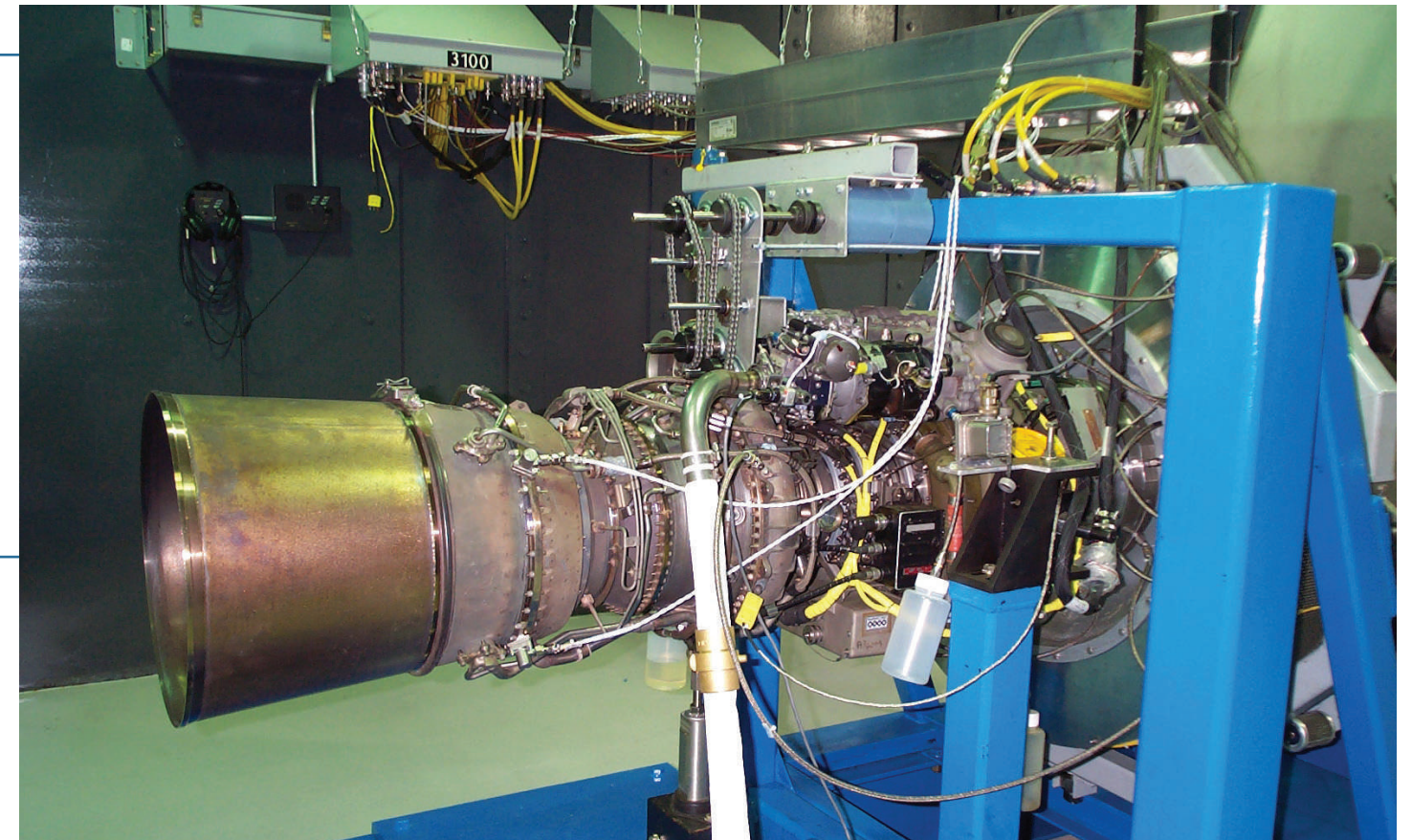
Navigation/Communications/Avionics

Aircraft Icing Testing - Natural and Artificial

Aircraft Platform Interoperability

Aircraft Survivability Testing

Software Regression



Sensors

Sensor and Seeker Field Tests

Special Characterization of Targets and Environments

Unmanned Aerial Vehicle (UAV)/UAS Testing and Training Support

Captive Carry Testing

Dirty Battlefield/Obscurants

Target Acquisition Sensor Measurements on Boresight, Minimum Resolvable Temperature Difference (MRTD), Noise Equivalent Delta Temperature (NEDT), Modulation Transfer Function (MTF) at Environmental Extremes

Testing of Forward-Looking Infrared (FLIR), Direct View Optics (DVO) and Day TV and Laser Range Finder (LRF) Systems and Subsystems at Temperature Extremes

Laser Beam Characterizations at Extreme Temperatures, Seeker/Radiometer Calibration, Image Processing, Target Paint Reflectivity Measurements

Non-Uniformity Correction (NUC) of Infrared (IR) Sensors, Scene Projector Arrays and Projector Systems

Propulsion

ROCKET/MISSILE PROPULSION TESTING

Rocket Motor Dissection for Propellant Aging Analysis
Exhaust Plume Attenuation and Signature Testing
Six Degrees of Freedom (6-DOF) Motor Firings with Thrust Vector Control Systems
DoD Army Representative of the National Rocket Propulsion Test Alliance (NRPTA)
Testing with Hypergolic Fuels and Oxidizers

SUPPLEMENTARY SERVICES

Assembly/Disassembly and Logistical Support for Large Missile Systems
Mobile Liquid Propellant Action Response Team (LPART)
Tanking/Detanking Operations of Liquid Engines

Inerting Operations of Warhead and Rocket Motors

AVIATION PROPULSION & ENVIRONMENTS TESTING

Ground Testing of Helicopter Engines (Air-Breathing, Turbo-Shaft)
Ground Testing of UAV Engines (Turbo-Prop)
Safety-of-Flight Testing (Explosive Atmosphere)
High Altitude and Rapid Decompression (12-ft Dia x 55-ft L Chamber)
Aircraft and Aviation Propulsion Components & Condition Based Maintenance (CBM) Testing



Subsystem Component & Surveillance

STRUCTURAL LOADING

MTS and Custom-Built Fatigue Test Tables
New Source Qualification Testing
Launcher, Rail, and Detent Load Capacity Testing
Superimposed Loading, Container Handling, and United Nations Performance Oriented Packaging (UN POP) Testing
Helicopter External Lift Static and Proof Loading
Tensile, Compression, and Shear Load Testing

AVIATION PLATFORM QUALITY DEFICIENCY REPORT (QDR)/CBM/CONFORMANCE INSPECTION PROGRAM (CIP)

Gearbox, Swashplate, Pump, Auxiliary Power Unit (APU) and Transmission Teardown and Analysis
Tooling and Test Stand Design and Fabrication
Hydraulic System/Component, Servo- Actuator, and Valve Testing
Clutch, Transmission, and Swashplate Dynamic Evaluations
CIP for Flight Critical Hardware

METROLOGY AND FILTER TEST LABS

Nondestructive Testing (NDT) / Nondestructive Evaluation (NDE)
Full Metrology [Weight, Center of Gravity (CG), and Moments]
X-Ray (Film and Direct Digital)
Dynamic Spin Balance
Environmentally Controlled Lab for Temperature, Humidity, and Particulate Levels
Total of 9 Coordinate Measuring Machines (CMMs), including 3 Ultrahigh Accuracy and 1 Portable
Hydraulic Filter Testing for Efficiency, Pressure Drop, Cyclic, and Steady Flows
Transmission Filter Testing, Including High Temperature and Flow Fatigue

ELECTRONICS, CABLE AND INSTRUMENTATION LABS

Component Adaptable Station Test Lab Electronic (CASTLE)
High Voltage Test Station & Cable Insulation Resistance/Voltage Breakdown
Strain Gauge, Load Cell, Crack Wire, and Fail Safe Instrumentation
Automated High-tech Data Collection and Recording Capabilities

FUNCTIONAL TESTING

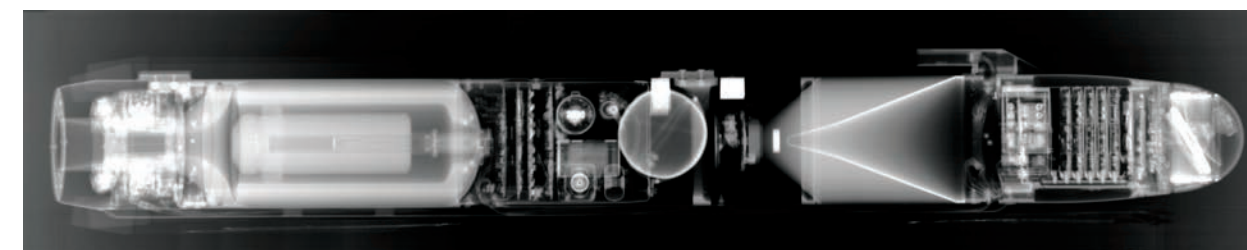
Missile, Launcher, and Ground Support Equipment Repair Parts Evaluations
Hydrostatic Testing, Pneumatics, Flow Assessment, and Leak Detection
Speed, Torque, and Mechanical Magnification Appraisals; Failure Analyses and Engineering Evaluations
Proof of Concept, First Article, Quality Verification and Lot Acceptance Testing

MISSILE SURVEILLANCE TESTING

Evaluation of Long-term Storage Effects
Screening for Reset Accuracy
Nondestructive Functional Testing
Air-Transportable, with Capability to Test Worldwide

STOCKPILE RELIABILITY TESTING

Gyro Tests
Battery/Coolant Tests
Accumulator Tests
Squib Tests
Gas Generator Cartridges
Shelf-life Extension Tests
Subsystem Testing



Modeling & Simulation

DISTRIBUTED TESTING

- Classified and Unclassified Computer Networks
- Fiber Links to All RTC Ranges and Laboratories as well as Connection to DREN
- Cross-Domain Solution
- Control of Local DTCC
- HWIL Testing
- Performance Assessment and Production Acceptance Testing of Millimeter Wave (MMW), IR, and Semi-Active Laser (SAL) Missile Seekers and All-Up Rounds (AURs)

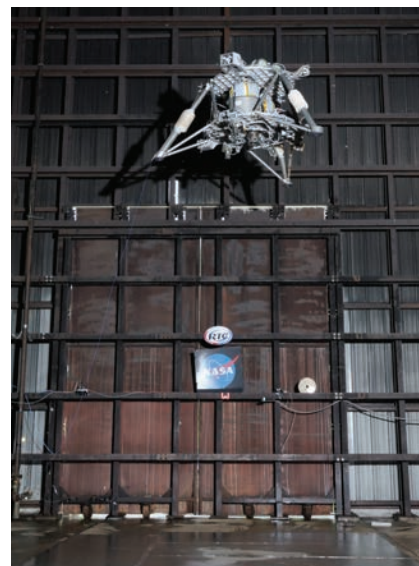
MODELING AND SIMULATION

- Finite Element Analysis
- Modal Analysis
- Transportation Analysis
- Rigid and Flexible Body Vehicle Dynamics
- Multi-Physics Analysis
- Solid Modeling
- Classified Distributed Test Node
- Terrain Induced Vehicle Vibration Effects

Munitions & Ordnance

- Ordnance Modification
- Prototype Missile Assembly
- Missile Telemetry Kit Installation
- Missile Modifications
- Component Removal and Replacement
- Explosive Prototype Development
- Flash X-ray and Detonation Velocity
- Missile Systems Exploitation
- Warhead Jet Characteristics

- Multiple Caliber Bullet Impact Testing (up to 3-round burst)
- Fragment Impact with 40 mm Bore up to 8,300 fps
- 40-ft Drop Testing of Live Munitions
- Slow and Fast Cook-off Tests
- Warhead Arena Tests
- Sympathetic Detonation
- Spall Impact
- Shaped Charge Jet Impact
- Vulnerability and Survivability Tests



Climatic

MIL-STD-810 TESTING

- Altitude
- Extreme (Low and High) Temperature
- Temperature Shock
- Solar
- Humidity
- Temperature/Altitude/Humidity
- Salt Fog
- Freezing Rain and Icing
- Blowing Rain and Dripping Rain
- Submersion/Leak
- Blowing Sand and Dust
- Settling Dust

FIELD SERVICES

- Life Cycle Environmental Profile (LCEP) Development
- Field Conditioning and Instrumentation
- Worldwide Historic Climatic Data
- DoD Storage Environment Database (High, Low, and Mean Temperature; Solar; Barometric Pressure; and Humidity)
- Test Specification Development



Dynamic

LABORATORY DYNAMIC TESTING

- Dynamic Testing of Hazardous Items at Temperature Extremes
- Electrohydraulic Vibration (High Force, High Displacement)
- Electrodynamics Vibration (High Force, High Frequency)
- 6-DOF Motion Replication
- Classical & Shock Response Spectra (SRS) Shock Replication (up to 48 X 48 Shock Machines)
- Pyro-Shock
- Acoustics and Vibro-Acoustics (Large Reverberation Chamber with 6-DOF Motion Replication)
- Acceleration (Centrifuge) Testing
- Fuze/Safe & Arm Device Functional Testing (Electrical/Electronic and Mechanical)
- Loose Cargo Testing
- Pendulum Impact Testing
- Drop Testing

FIELD DYNAMIC TESTING AND ANALYSIS

- Instrumented Road/Mobility of Wheeled/Tracked Vehicles
- Rail Impact (Hazardous and Temperature Extremes)
- Mobile Data Acquisition and Signal Analysis
- Laboratory Vibration Schedule Development
- Unmanned Ground Vehicle (UGV) Testing

Electromagnetic Environmental Effects (E³)

AVIATION AND MISSILE SYSTEM TESTING

- Electromagnetic Radiation Operational (EMRO)
- Electromagnetic Interference (EMI) MIL-STD-461F
- High Intensity Radiated Field (HIRF)
- Hazards of Electromagnetic Radiation to Ordnance (HERO)
- Hazards of Electromagnetic Radiation to Personnel (HERP)
- Hazards of Electromagnetic Radiation to Fuel (HERF)
- Electromagnetic Vulnerability (EMV)
- Electromagnetic Compatibility (EMC)
 - Power Quality
 - Source/Victim
 - Noise Floor
 - Electronic Explosive Devices (EEDs)
- Electrostatic Discharge (ESD)
 - Helicopter-generated ESD (HESD)
 - Personnel-borne ESD (PESD)
- Lightning Effects
 - Direct Strike
 - Near Strike
- Precipitation Static (P-Static)
- DO-160E (Pin-Injection Lighting, Bulk-Cable Injection)
- MIL-STD-704A-F (Power Quality/Compatibility)
- Emissions Control (EMCON)
- Electromagnetic Pulse (EMP)/Nuclear
- Antenna Pattern Measurements
- Radar Cross Section (RCS)
- Shielding Effectiveness (SE)

SUPPLEMENTARY SERVICES

- Electromagnetic Engineering Support
- Electromagnetic Environment Definition
- Electrostatic Charge Measurements
- Aircraft Ground Station Support
- Telemetry Ground Station Support

SPECIALIZED CAPABILITIES

- High Fidelity Instrumentation Design, Development and Fabrication
- DoD Unique Live Ordnance Lightning Effects and ESD Testing
- Transportable Lightning Effects and ESD Testing
- Full MIL-STD-464A and ADS-37A-PRF Radio Frequency (RF) Test Levels
- Large Reverberation Chamber
- Counter Improvised Explosive Device (IED) Test and Evaluation
- National Association of Radio and Telecommunications Engineers (NARTE) certified test personnel
- Joint Preflight Integration of Munitions and Electronic Systems (J-PRIMES) Facility
- Radiation Hazards (RADHAZ) Surveys and Assessments
- RCS



J-PRIMES (Eglin Air Force Base)

- System and Component Level EMC Testing
- Threat Emitter Simulation
- Radar-Target Generation
- Antenna Pattern Measurements

How We Work **HOW**

The Center retains a small group of senior Test and Evaluation, and Systems Engineering professionals to assist customers in test design, coordination, planning and performance analysis. This group serves as the initial point of contact for customers, and responds to changing customer needs.



RTC Test Services

How We Work/Contact Information



CONTACT INFORMATION

SYSTEMS ENGINEERING DIRECTORATE

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