2003 ATEC Industry Days

Michael T. Krause
Actg Ch, Subsystem Test
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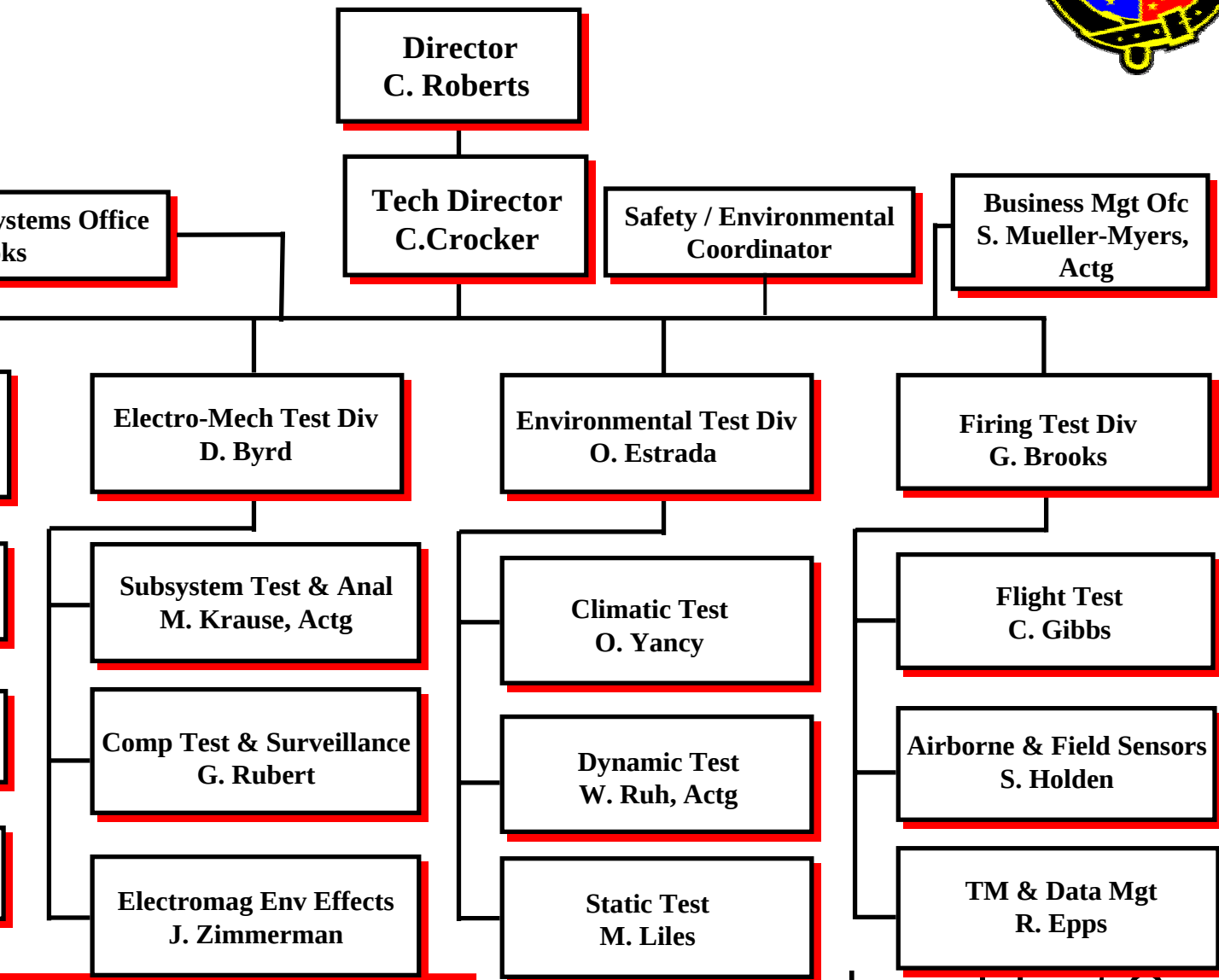
256.876.4473

April 27, 2004

U.S. ARMY TEST AND EVALUATION COMMAND

REDSTONE TECHNICAL TEST CENTER



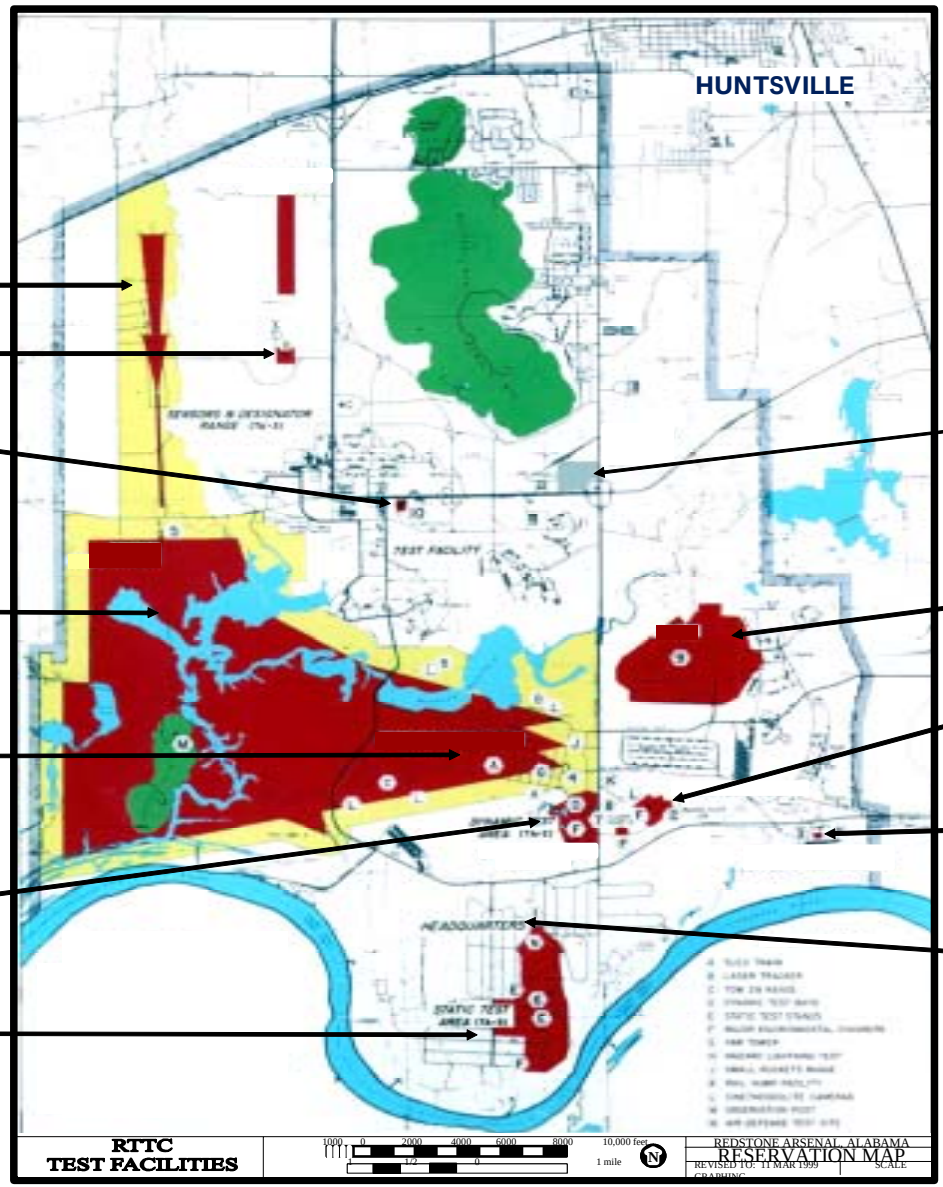
REDSTONE TECHNICAL TEST CENTER

186 Civilian
366 Contractors
552 Total

14,000 Acres
810,000 Building Sq. Ft.
***$400 Million Investment**

***Excludes Land Valued at $104 Mil**

RTTC Test Facilities



RTTC MISSION

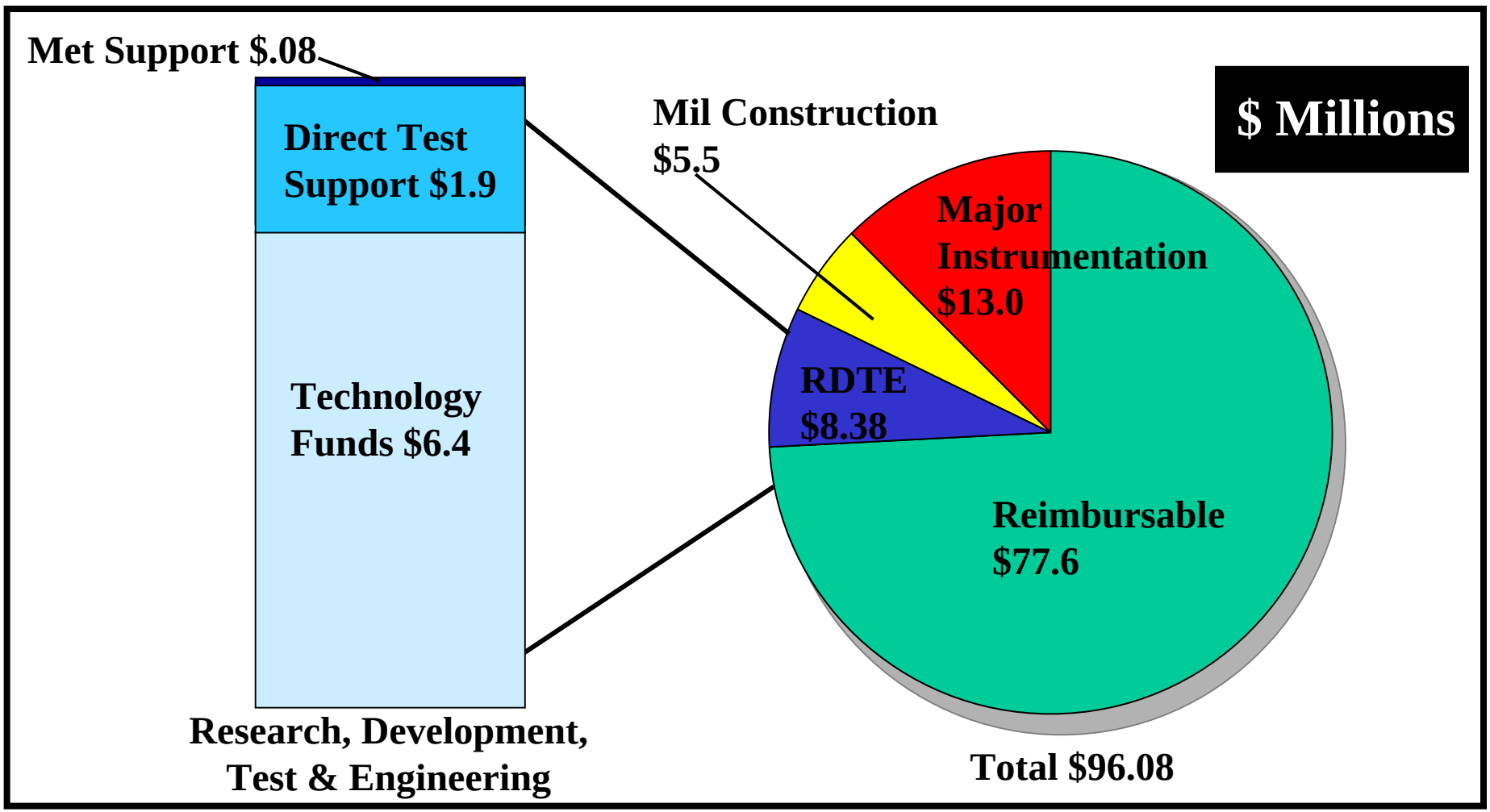
- **Army Technical Tester for Small Rockets and Guided Missile Systems**

- **Army Technical Tester for Missile and Aviation Components/Subsystems**

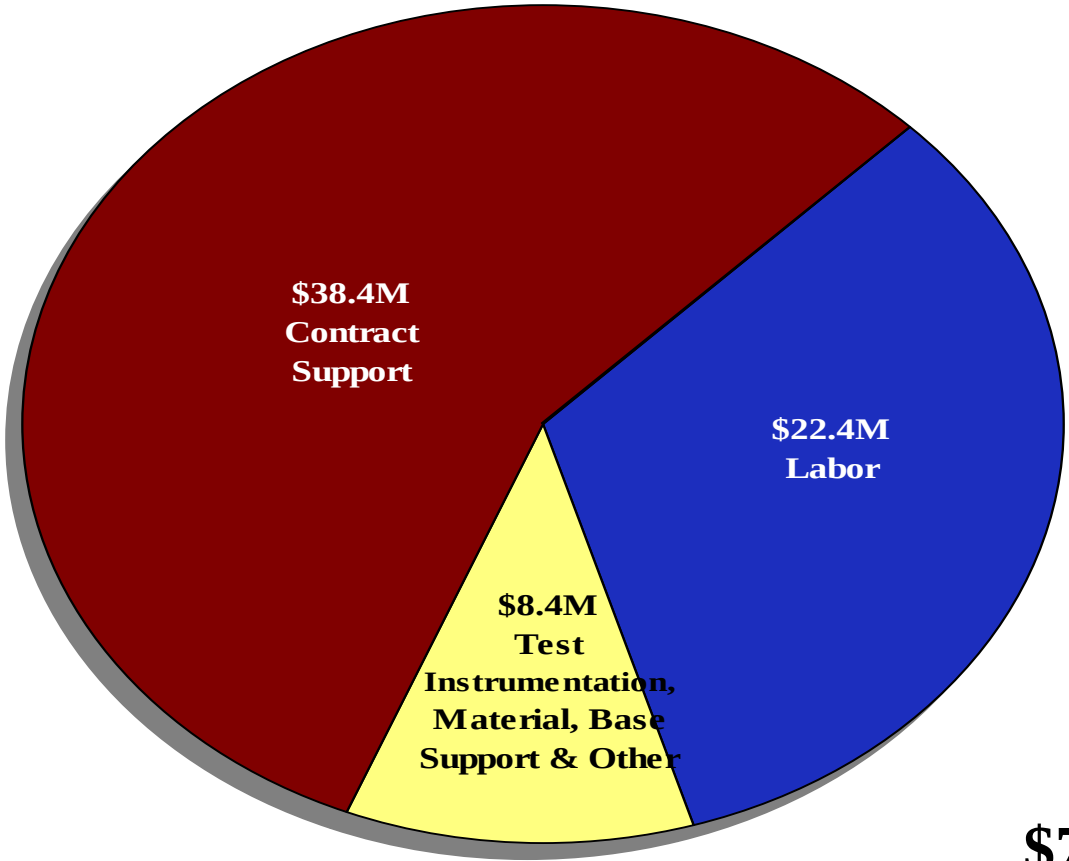
- **DOD <u>Lightning</u> Tester for <u>Explosive / Hazardous</u> Materiel**

Concept thru Operations & Support

FY05 Projected RTTC Budget



FY05 Projected Budget by Operating Account



$77.62 Million

Test & Evaluation Support Contracts

DESCRIPTION	EXPIRES	EST. VALUE IN $ MIL
Test Management Division Support Contract(*)	May 2005	30.2
Environmental Test Division Support Contract	May 2005	73.3
Firing Test Division Support Contract	Oct 2007	88.5
Electro-Mechanical Test Division Support Contract	Mar 2008	77.4

(*) - 8A Set Aside

Focus Areas for FCS Test Support

- **Principle Technology Capabilities, Competencies and Future Growth Requirements**
  - Sensors & Sensor Fusion T&E
  - Smart Munitions T&E
  - Subsystems & Components T&E
  - Active Protection Systems T&E
  - Environments (Electromagnetic, Climatic, Dynamic, Synthetic)
  - Mobile Test & Instrumentation
  - Telemetry
  - M&S, Live/Virtual Integration
  - Distributed Simulation & Test
  - HPC, Network Integration

- **FCS Systems Focus**
  - Unmanned Ground Vehicles
  - Unmanned Aerial Vehicles
  - Sensors
    - Ground Vehicles
    - Air Vehicles
    - Unattended Ground Sensors
  - Intelligence Surveillance, Reconnaissance (ISR) – Sensor Fusion

Scene Projector Technology

Sensor Fusion / Multispectral Scene Generation and Projection

Existing IR Scene Generation and Projection

Dynamic Infrared Scene Projector

DIRSP

Flight Motion Simulator IR Scene Projector (FIRSP)

Mobile IR Scene Projectors

Scene Projector Technology is Used for test planning, test rehearsal, and performance evaluation to:

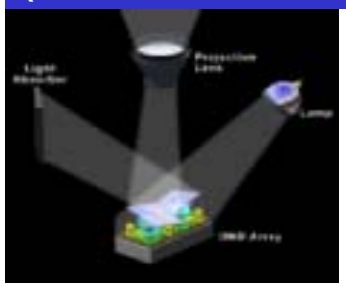
REDUCE RISK …. By Expanding the Test Envelope, Providing Repeatability and Improving the Failure Analysis

SAVE COSTS…. By Reducing Dependence on Expensive Live Testing

Proposed Technology Expansion

Mobile Extended Spectrum Electro-Optical Test Transformation Initiative (MEOTTI)

(Partner with AMRDEC)



DMD (1280x1024)

Grain of Salt On DMD

Technology Expansion Areas

- Extended Spectrum (UV, VIS, NIR, MWIR, LWIR)
- Sensor Fusion
- Integrated Sensor Evaluation On Air or Ground Platforms

Portable Test Capabilities

Providing "Everything but the dirt."
To Support DT/OT Testing

Required Capabilities

Portable Range Control

Autonomous Self Contained with Complete Data, Status, Communications and Control Networks Integrated with Planning, Execution and Post Test Analysis Tools

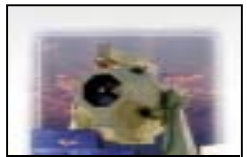
Distributed Test Functionality

Portable HWIL Tools (MIRSP)

Portable Data Collection & Real Time Display

- Improved On Platform and On Location Data Collection

Telemetry



Advanced TSPI

JAV-STARS Based UUT Instrumentation

Video, Film, Radar, Meteorological

Portable Testing will Support

Missile Systems

FCS System of System Testing

Airborne Subsystems

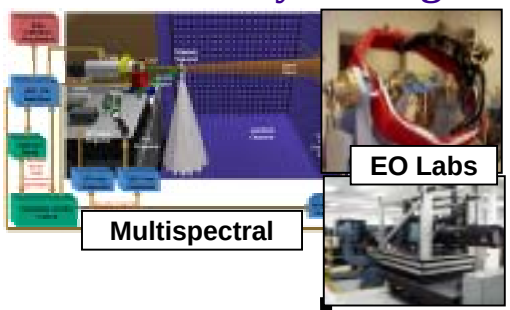
Portable Capabilities Allow for Operational Type Testing with Developmental Level Instrumentation and Provide Test Rigor For RTTC Customers with Expanded Use of Undeveloped Ranges

Distributed Testing

Required Capabilities

- Upgraded Infrastructure
- Distributed Test Tools
- Synthetic Environments
- Architecture Development
- Automated Data Collection & Archive

Laboratory Testing



Range Testing

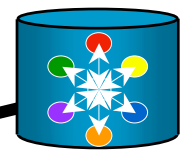
Environmental Testing

Lab Architecture

Range Architecture

Environmental Architecture

ILH



Data Collection and Archive

DREN

RTTC Distributed Test Control Center

Required Local Test Facilities to Support and Involve Aviation Customers

(Testers, PMO, RDEC, Contractors)

Redstone Aviation Propulsion Test and Research (RAPTR) Capabilities

Comanche, Blackhawk and Apache Engine Testing (T-700 Engines) Online With Proposed Phase II that will add Larger Engines and **Expansion Proposals for:**

- **Hydraulic component testing**
- **Electronic components**
- **Engine Transmission Testing**
- **Spin Test Facility**

Aviation Subsystem Integration Testing

- **Ground System Integration Testing**
- **On Platform Component/ Subsystem Test & System Integration**
- **Staging Area for Range and Environmental Testing**
- **Multispectral Sensor Test Capabilities**

Proposed RTTC Environmental Capability Upgrades

- **Dynamic Testing Enhancement to Provide High Fidelity 6-DOF Helicopter Motion Replication with Full System Level Dynamic Test Functions and Integrated Sensor Suite Performance Evaluation**
- **Enhanced E3 Facilities**
- **Climatic Test Enhancement with Multiple Environments**

"On Platform" Testing in Multiple Environments

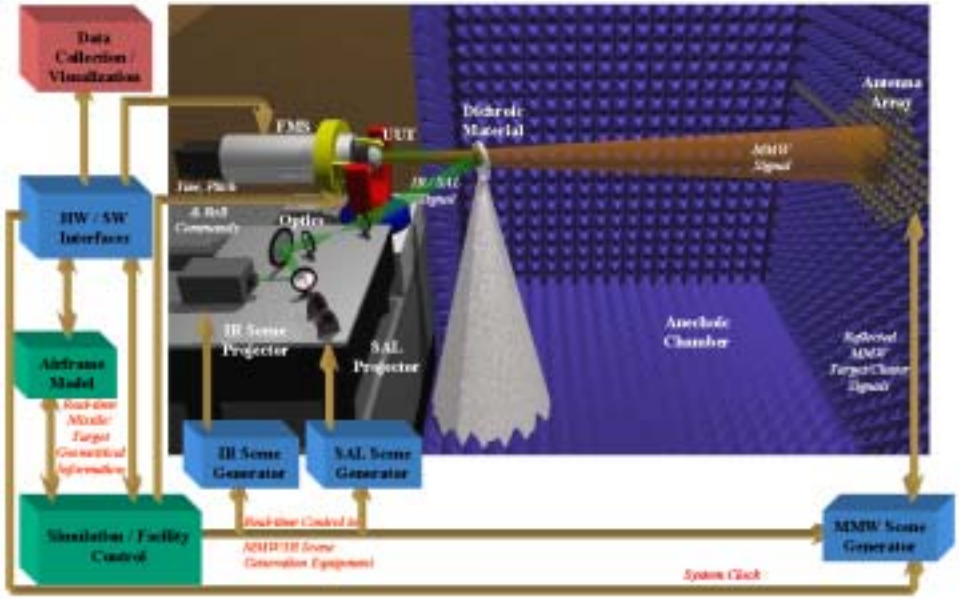
Partnerships

Redstone Technical Test Center

Advanced Multi-Spectral Simulation, Test & Acceptance Resource (AMSTAR)

High Fidelity Capability
- Multi-targets
- Countermeasures
- Performance Testing

Lower Fidelity Capability
- Simple targets
- Functional testing
- Hazardous Rounds



How Facility Will Be Utilized
- System Design
- Prototype Testing
- Engineering Tests
- Pre-Flight Confidence
- Developmental Testing
- Qualification Testing
- Operational Test Support
- First Article Testing
- Production Testing
- Stockpile Reliability Testing

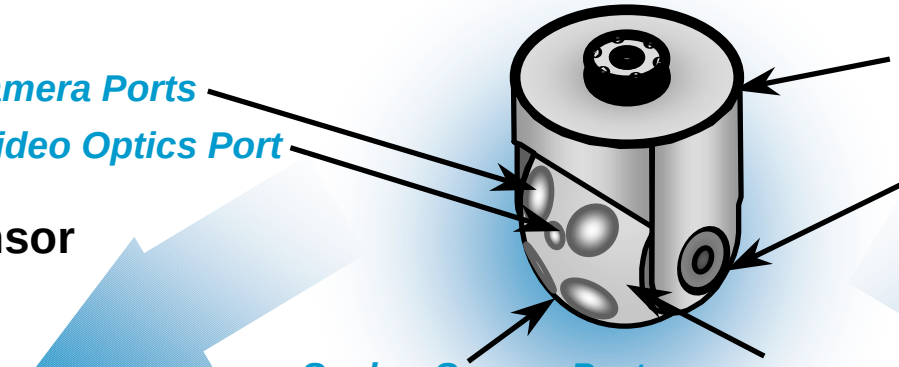
Leverages the Success of the RTTC STAF Facility for Multispectral (MMW, IR, Laser) Missile System Hardware-in-the-Loop Testing in Lieu of Expensive Flight Tests (cradle to grave).

Target Customer: Common Missile

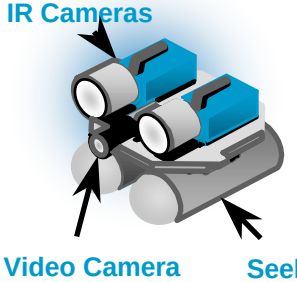
Other Customers: *BAT P3I,* NetFires PAM and NetFires LAM

Developed, Validated and Operated in Partnership with AMRDEC, PM AGMS, PEO STRI

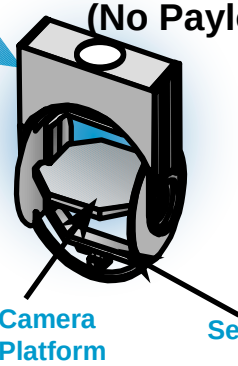
Investment / Potential Homeland Defense Application: Stabilized Electro-Optic Airborne Instrumentation Platform (SEAIP)



Camera / Sensor Payload



Gimbal (Skin Removed) (No Payload)



- **Designed for Maximum Payload Integration Flexibility**
- **Dual Gate Auto-Tracker Provided with System**
- **Will Slave to Other On-Board Seeker / Turret Systems**
- **Maintains Boresight Between All Sensor Payloads**
- **Designed for Simultaneous Carriage of Multi-Spectral Sensors (IR, Visual, Radar)**
- **On-Board Cryogenic Subsystem**
- **2 Systems in very active use in RTTC Inventory, 3rd System Proposed**

Proposed Homeland Defense Uses

- Chem Bio Sensor Evaluations Using SEAIP-Follow on to current Turbo FT and AIRIS Testing
- Potential Use of SEAIP Platform Itself as a Carrier for Homeland Defense Sensors (example JIGSAW)
- Generation of High Resolution Multispectral Terrain Databases Including 3-D Models of Structures
- Build Urban Terrain Structures with Realistic and Representative Signatures for Sensor Evaluations

Military Systems Test & Integration Hub

Artists Rendering of the T&I Hub

Unmanned Vehicles

- Test capability for Live Weapons and Ordnance on Unmanned Ground and Arial Vehicles
- Challenge is to guarantee the safety of the soldier/marine in all environments

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Redstone Competition Advocates Shopping List Web Site:
http://www.redstone.army.mil/cmo/casl.html