

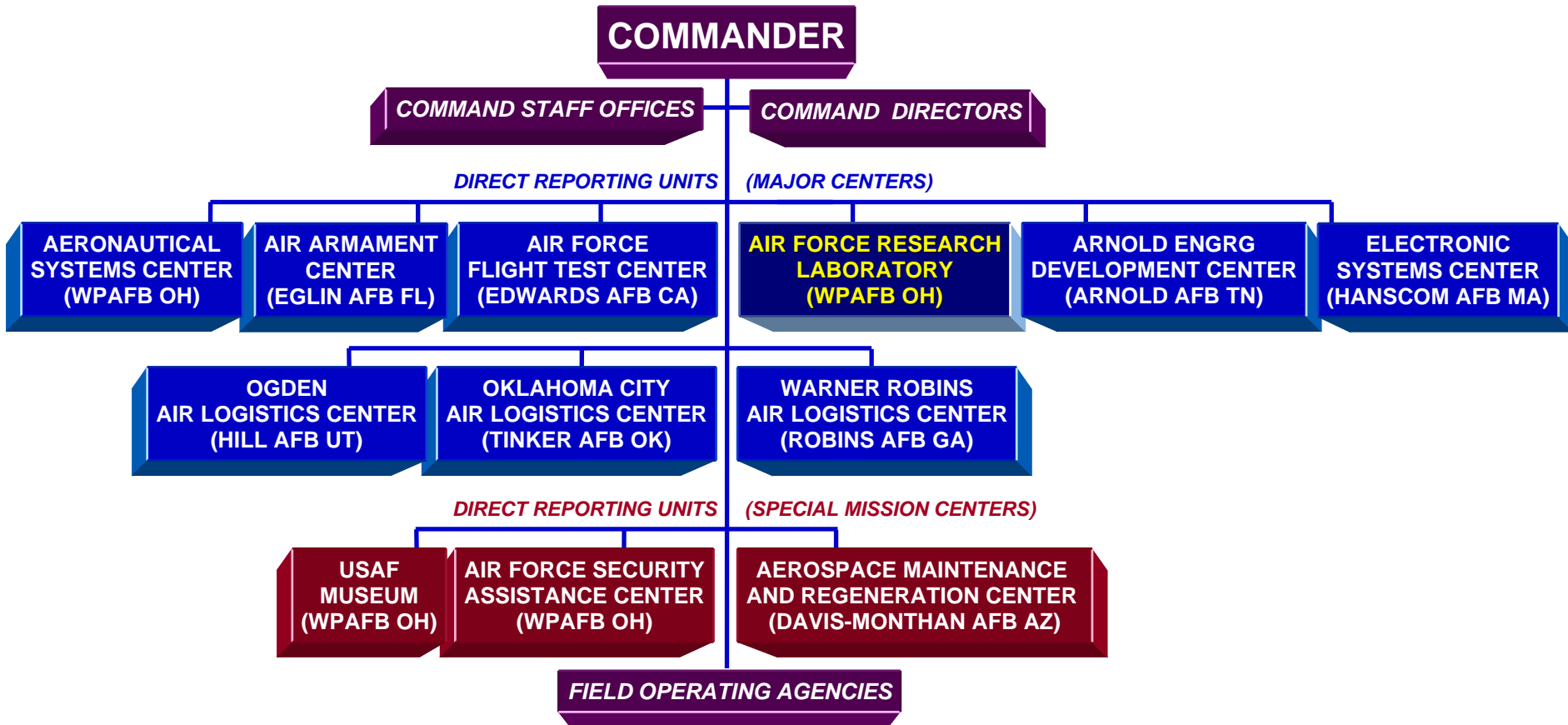
WARFIGHTER READINESS RESEARCH DIVISION OVERVIEW



Mark E. Sturgell
Technology Integration Manager
Human Effectiveness Directorate
Air Force Research Laboratory

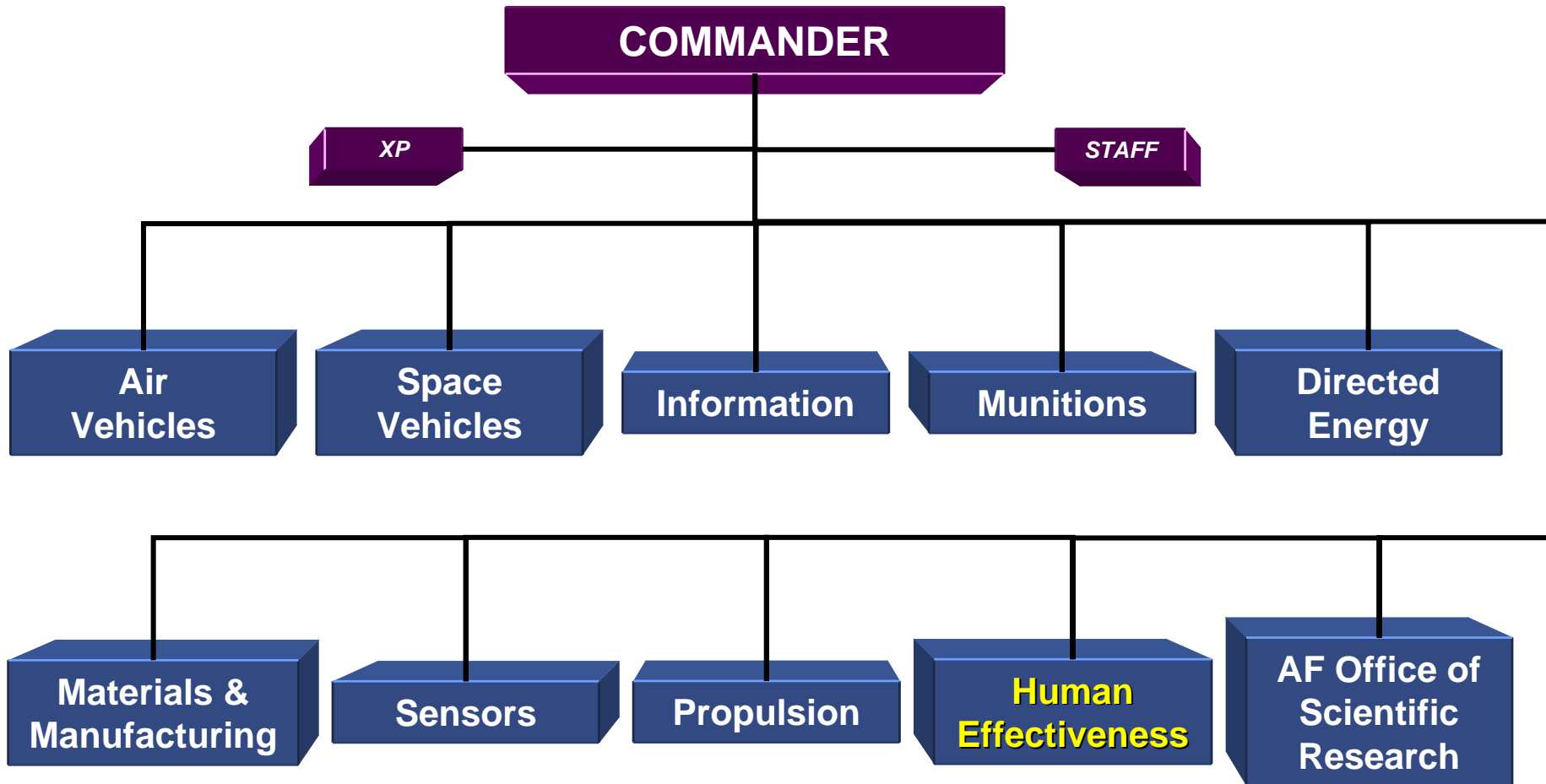


Air Force Materiel Command





Air Force Research Laboratory





Human Effectiveness Directorate



**The
Human Effectiveness
Directorate**



Mesa Research

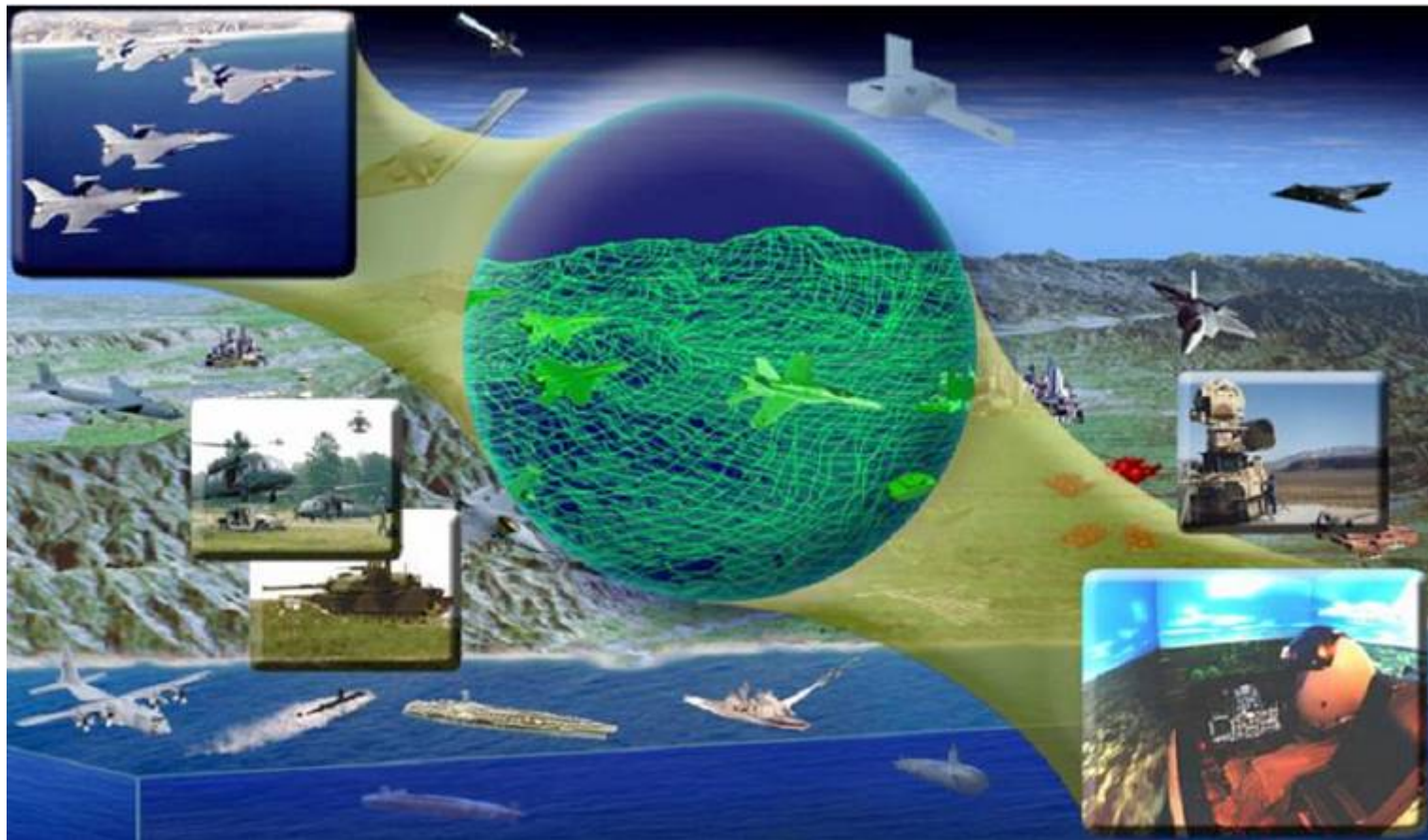




AFRL/HEA Vision



The Warfighter Readiness Research Division—Preeminent in the science and technology of training airmen





AFRL/HEA Mission



Research, develop,
demonstrate, evaluate
and transition leading
edge technologies and
methods to train
warfighters, **enabling
the expeditionary air
and space force**

“The best way to predict the future is to create it”

Peter Drucker



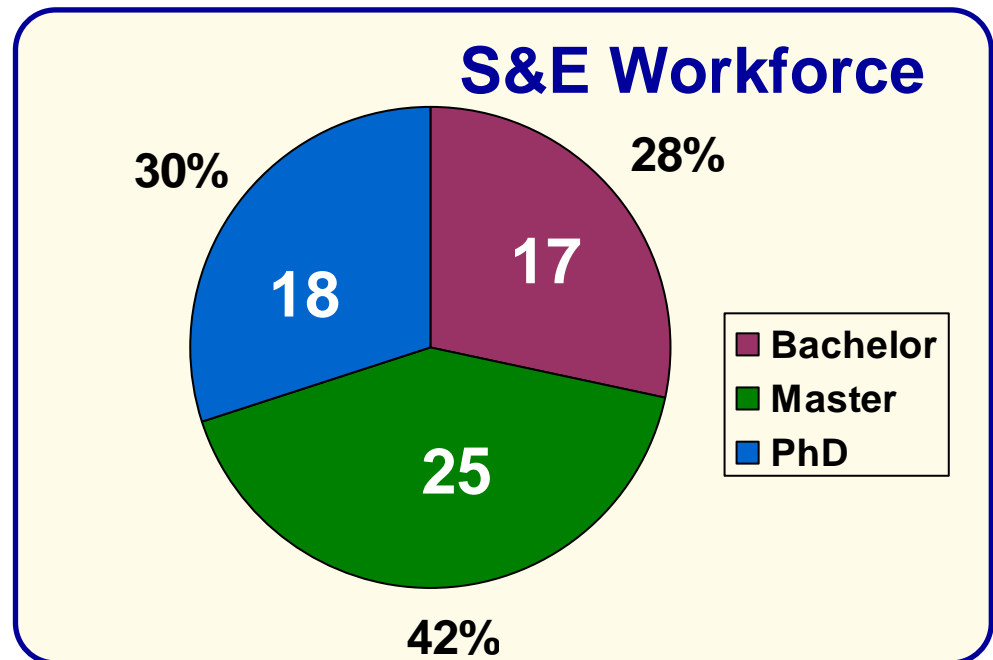
Government Disciplines

(Mesa Data Only)



- Cognitive Psychology
- Experimental Psychology
- Industrial/Organizational Psychology
- Instructional Psychology
- Aviators
- Flight Surgeon
- Intelligence Specialist
- Physiology
- Security Specialist
- Aeronautical Engineering
- Electrical Engineering

- Mechanical Engineering
- Computer Science
- Operations Research
- Optics
- Physics





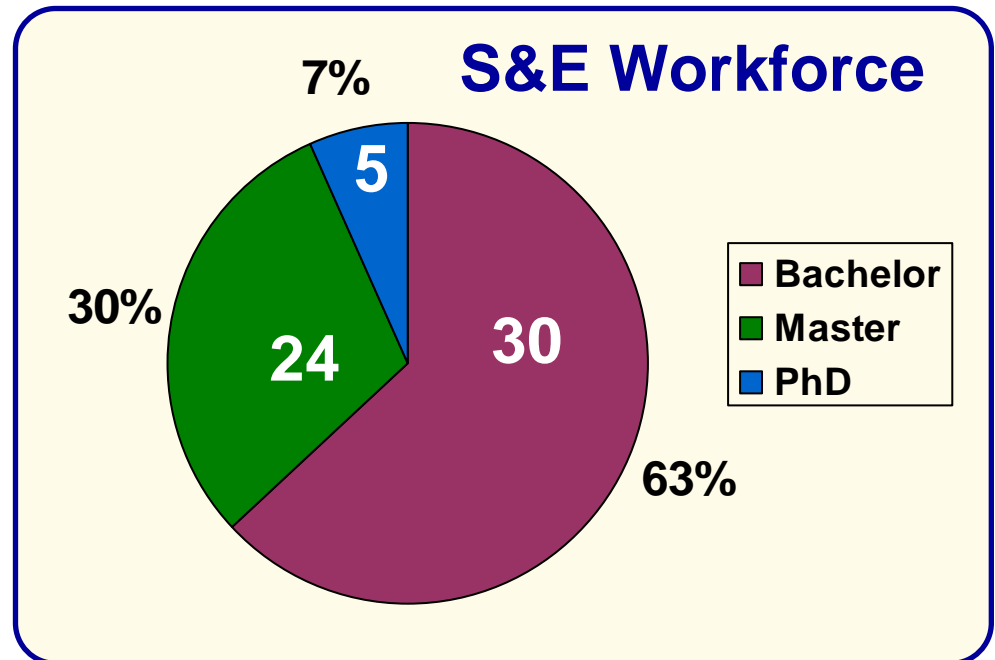
On-site Contractor Disciplines

(Mesa Data Only)



- Educational Psychology
- Experimental Psychology
- Computer Science
- Operations Research
- Mathematics
- Physics
- Visual Perception
- Aeronautical Engineering
- Human Factors Engineering
- Network Engineering
- Software Engineering
- Systems Engineering

- Aircrew Training SME
- Cockpit/IOS Design/Fab
- Multimedia Graphic Design
- Visual Display Design/Fab
- Statistical Analysis





Core Competencies



- **Theory and Science of Learning and Instruction**
- **Methods for Development and Evaluation of Warfighter Training**
- **Tools and Technologies for Training for Warfighting**
- **Tools and Technologies for enhanced Flight Line Maintenance operations**



Extramural Collaborators



Stotler Henke
Smarter Software Solutions

SOLIPSYS

gOE
the group for organizational effectiveness

MAK
TECHNOLOGIES

NORTHROP GRUMMAN
Litton PRC
A Northrop Grumman Company

CU-Boulder
1876 - 2001

USAFA

LOCKHEED MARTIN

BOEING

UDRI
UNIVERSITY
of DAYTON
RESEARCH
INSTITUTE

Simulation Technologies, Inc.
STI
MODELING AND SIMULATION FOR THE WARFIGHTER

**CHANDLER-GILBERT
COMMUNITY COLLEGE**



Micro Analysis & Design

Knowledge Analysis Technologies

THE UNIVERSITY OF OKLAHOMA
One of America's
100 Best College Boys

UT
The University of Tennessee

DARPA

**MAICOPA
COMMUNITY
COLLEGES**

ASU ARIZONA STATE
UNIVERSITY EAST

New Mexico State University



Schafer

L3
communications
Link Simulation & Training
We Know Training
From The Ground Up

UGA
1785

**OFFICE OF
ONR
NAVAL RESEARCH**

M
Metrics, Inc.

ATM



USF University of
South Florida

SDS
International



**Multinational
Partners**



Where We Are



Programs with upcoming transitions

- **20/20 Immersive Visual Display for DMO**
- **Warfighter Readiness Assessment and Performance Measurement Tracking System (WRAPMTS)**
- **Joint Terminal Air Control Training and Rehearsal System (JTAC-TRS)**
- **Deployable DMO**



20/20 Immersive Visual Display for DMO



- High fidelity visual and sensor simulation system for day & night combat ops training & mission rehearsal
- Low O&M cost
- Eye-limited high resolution projector
- PC-based image generator
- Correlated multi-spectral geo-specific photorealistic visual & sensory imagery
- Development with Evans & Sutherland
- In Transition Now

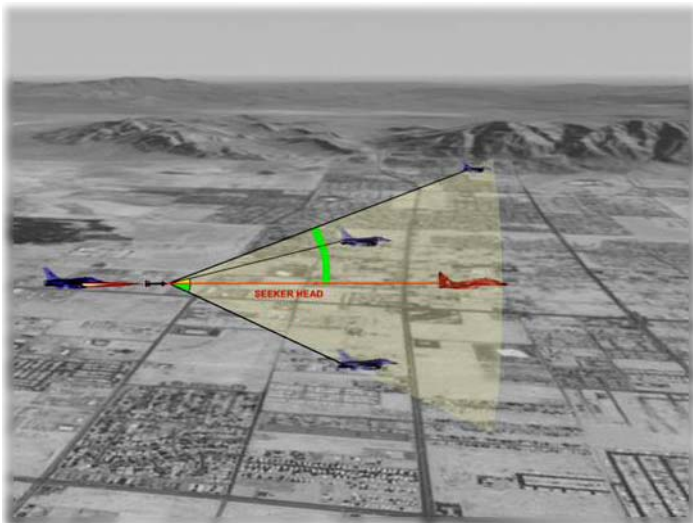




Warfighter Readiness Assessment & Performance Measurement Tracking Sys.



- Defines mission requirements in knowledge, skill, experience terms (e.g., fighters, AWACS, AOC, Space, IO/IW, UAV)
- Enables *proficiency-based* requirements and assessments
- Human-centered performance measurement standards
- Automated performance assessment and tracking tools
- **Transition in FY08**





Joint Terminal Air Control Training and Rehearsal System



- Unique, human-in-the-loop Close Air Support / Special Tactics training and rehearsal
- High fidelity, realistic visualization with sensor, simulator and database correlation
- Embedded training strategies and methods
- Real-time visualization techniques
- Capability to operate with current JTAC tools and interoperate with legacy sims
- CSAF endorsed approach; Brings JCAS into DMO
- 4-phase leveraged spiral development
 - Immersive Environment
 - Schoolhouse
 - Garrison/Deployable
 - Man-Portable
- **Transitions: FY08, FY09**





Deployable DMO



- Deployable mission operations training and rehearsal technology suite for full combat tactical training and rehearsal
- Task-training level fidelity requirements
- Scalable architecture to support desktop and palletized DMO training and rehearsal
- Agent-enabled syllabus authoring methods
- Simulation/instruction management tools
- Interactive after action review/debrief tools
- Increased availability of higher fidelity training environment for operational units
- **Transition: FY10**





Where We Are Going

Distributed Mission Training



Live Training with Common Performance Measures

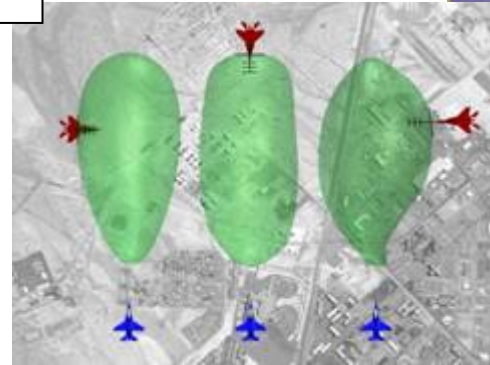
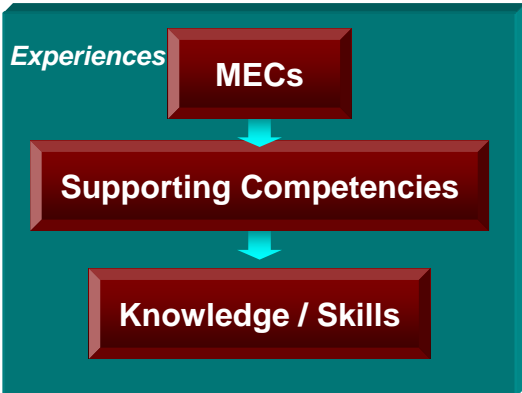


Distributed Mission Operations



Performance Measurement

DMT Research Graduates									
Report	View	Print	Facility	Report #	Team ID	3-Block 3-Block/4	3-Block 3-Block/4	3-Block 3-Block/4	3-Block 3-Block/4
General Mission Objectives									
3. The Scenario									
3.1. Mission use of GCS									
3.2. BTR all-time range									
3.3. DMT's Valid items									
3.4. Mission control support									
3.5. Ground 3-3 Comm									
Specific Mission Objectives (Not below)									
3.1. Mission Objectives									
3.2. Mission Objectives									
3.3. Mission Objectives									
3.4. Mission Objectives									
3.5. Mission Objectives									
3.6. Mission Objectives									
3.7. Mission Objectives									
3.8. Mission Objectives									
3.9. Mission Objectives									
3.10. Mission Objectives									
3.11. Mission Objectives									
3.12. Mission Objectives									
3.13. Mission Objectives									
3.14. Mission Objectives									
3.15. Mission Objectives									
3.16. Mission Objectives									
3.17. Mission Objectives									
3.18. Mission Objectives									
3.19. Mission Objectives									
3.20. Mission Objectives									
3.21. Mission Objectives									
3.22. Mission Objectives									
3.23. Mission Objectives									
3.24. Mission Objectives									
3.25. Mission Objectives									
3.26. Mission Objectives									
3.27. Mission Objectives									
3.28. Mission Objectives									
3.29. Mission Objectives									
3.30. Mission Objectives									
3.31. Mission Objectives									
3.32. Mission Objectives									
3.33. Mission Objectives									
3.34. Mission Objectives									
3.35. Mission Objectives									
3.36. Mission Objectives									
3.37. Mission Objectives									
3.38. Mission Objectives									
3.39. Mission Objectives									
3.40. Mission Objectives									
3.41. Mission Objectives									
3.42. Mission Objectives									
3.43. Mission Objectives									
3.44. Mission Objectives									
3.45. Mission Objectives									
3.46. Mission Objectives									
3.47. Mission Objectives									
3.48. Mission Objectives									
3.49. Mission Objectives									
3.50. Mission Objectives									
3.51. Mission Objectives									
3.52. Mission Objectives									
3.53. Mission Objectives									
3.54. Mission Objectives									
3.55. Mission Objectives									
3.56. Mission Objectives									
3.57. Mission Objectives									
3.58. Mission Objectives									
3.59. Mission Objectives									
3.60. Mission Objectives									
3.61. Mission Objectives									
3.62. Mission Objectives									
3.63. Mission Objectives									
3.64. Mission Objectives									
3.65. Mission Objectives									
3.66. Mission Objectives									
3.67. Mission Objectives									
3.68. Mission Objectives									
3.69. Mission Objectives									
3.70. Mission Objectives									
3.71. Mission Objectives									
3.72. Mission Objectives									
3.73. Mission Objectives									
3.74. Mission Objectives									
3.75. Mission Objectives									
3.76. Mission Objectives									
3.77. Mission Objectives									
3.78. Mission Objectives									
3.79. Mission Objectives									
3.80. Mission Objectives									
3.81. Mission Objectives									
3.82. Mission Objectives									
3.83. Mission Objectives									
3.84. Mission Objectives									
3.85. Mission Objectives									
3.86. Mission Objectives									
3.87. Mission Objectives									
3.88. Mission Objectives									
3.89. Mission Objectives									
3.90. Mission Objectives									
3.91. Mission Objectives									
3.92. Mission Objectives									
3.93. Mission Objectives									
3.94. Mission Objectives									
3.95. Mission Objectives									
3.96. Mission Objectives									
3.97. Mission Objectives									
3.98. Mission Objectives									
3.99. Mission Objectives									
3.100. Mission Objectives									



Tailored Scenarios & Validated Measurement



Where We Are Going



Optimize readiness training and rehearsal experiences by providing scientifically-based advanced distributed simulation capability incorporating *live*, *virtual* and *constructive* players

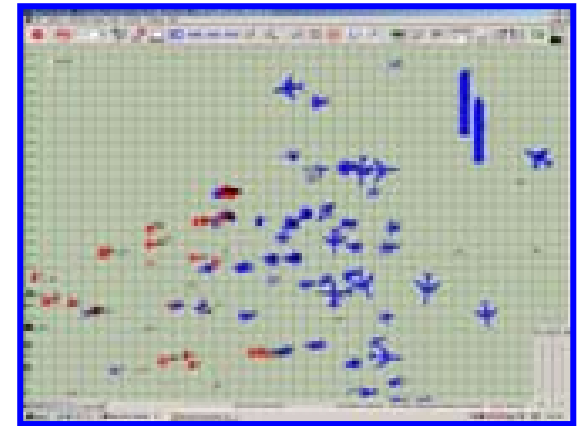
Live



Virtual



Constructive





Where We Are Going



AUTOMATED SYSTEMS TAILOR SCENARIOS BASED UPON INDIVIDUAL PROFICIENCY



**EMBEDDED
INTELLIGENT
TUTORS COACH
STUDENTS**



**EMBEDDED AGENTS
ASSESS
PERFORMANCE**



Warfighter Readiness Training Research Contract



Contract Type: CPFF, IDIQ, Multiple Delivery Orders
 Period of Performance: July 2005 – July 2010
 Ceiling: \$300M
 Place of Performance: Mesa, Arizona (www.mesa.afmc.af.mil)

POC: Jay Carroll (AFRL/HEA)
 480-988-6561 x148
jay.carroll@mesa.afmc.af.mil

Description

On-demand integration of live, virtual, and constructive systems to immerse the warfighter in realistic operational environments

Technologies

- Rapid database and scenario development
- Models of human learning and effectiveness
- DMO performance measurement & assessment
- C4ISR live/simulation linkage and recovery
- Distributed event integration & management
- Distributed system reliability & security

Benefits to the Warfighter

- Immersive, theater level, integrated training and rehearsal systems
- Mission rehearsal based on rapid integration of tactical information
- Theater-level performance measurement & assessment
- Enhanced training realism
- Reduced cost and overhead associated with DMO training & rehearsal
- Reduced footprint and more efficient reachback



Science & Technology For Training and Logistics Transformation



SCHEDULE:
 BAA Announcement: Dec 2004 (BAA 05-04 HE)
 Receive Proposals: Open through 31 Dec 2009
 Number of Awards: TBD

Contract Type: Cost Plus Fixed Fee or Cost (no fee)/
 Cooperative Agreements or Grants
Ceiling: \$24.9
Acquisition POC: Jay Carroll (AFRL/HEA)
 480-988-6561 x148
jay.carroll@mesa.afmc.af.mil

Description	Benefits to the Warfighter
<p>Research, develop, demonstrate, evaluate, and transition leading edge technologies and methods to train warfighters and optimize human-centered logistics processes, enabling the expeditionary aerospace force.</p>	<ul style="list-style-type: none"> • Immersive, theater level, integrated training and rehearsal systems • Mission rehearsal based on rapid integration of tactical information • Theater-level performance measurement & assessment • Reduced cost and overhead associated with DMO training & rehearsal • Reduced footprint and more efficient reachback • More efficient logistics operations <ul style="list-style-type: none"> -Faster planning/replanning -Less manpower & quicker deployment response
<p>Technologies</p> <ul style="list-style-type: none"> • Models of human learning and effectiveness • DMO performance measurement & assessment • C4ISR live/simulation linkage and recovery • Distributed event integration & management • Integrated Portable Human Computer Interfaces 	