



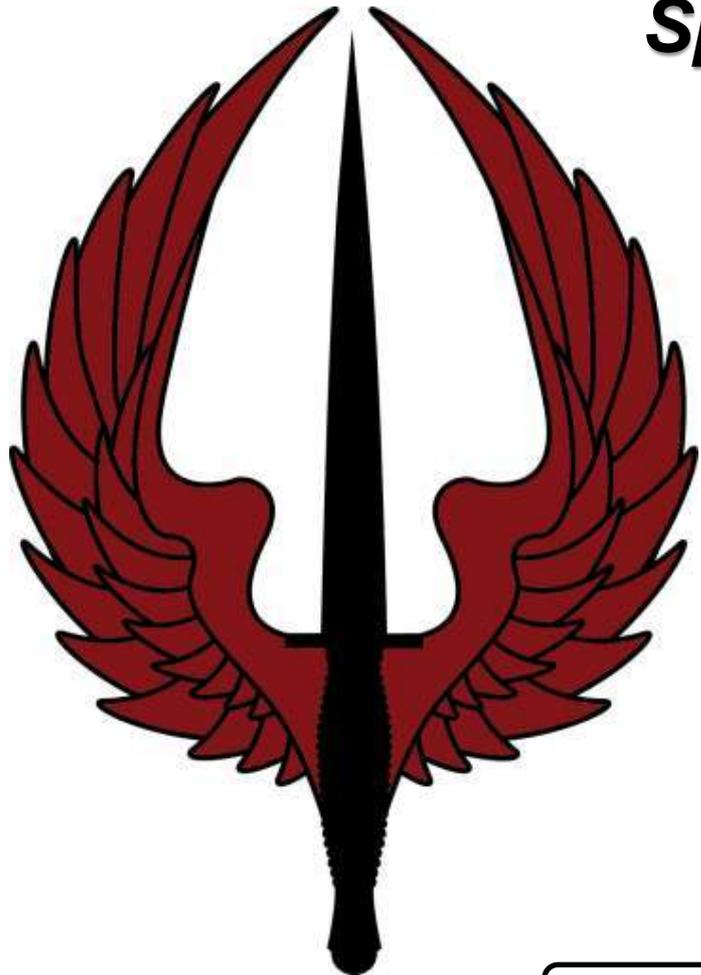
United States Army Special Operations Aviation Command

Special Operations Forces Industry Conference (SOFIC)

“Warfighter Requirements” Science & Technology Fusion in Army Special Operations Aviation

Systems Integration Management Office (SIMO)

**LTC McDonald
21 May 2014**



(Bob Walker, 270.798.1830, bob.walker@soar.army.mil)



Purpose

- SOFIC Overview addressing Requirements including Science and Technology
- Provide top-level assessment for future requirements across the SOF Aviation Battlefield
- Path and Vision
- S&T potentials
- Conclusion



SIMO Mission



- *Design, Develop and Deliver Aviation Capability* to the Army Special Operations Aviation Enterprise.
- Empowering *War Fighter Domination* through the most capable rotary-wing, unmanned aerial systems (UAS), fixed-wing and mission systems in the world.
- Maintaining *ARSOA Comparative Advantage* by means of a technology driven SOF Warrior Focus.



Design

Develop

Deliver

Dominate



SIMO Core Competencies

(Applies to rotary-wing, unmanned systems and fixed-wing*)



Continuous process improvement

1. Joint/SOF Capabilities Development

New Requirements

2. Systems Engineering and Integration

3. Developmental Testing and Evaluation

4. Operational Testing and Evaluation

Product Design,
Platform
Integration,
Development,
DT/OT

5. System Fielding and Lifecycle Sustainment
planning and resource oversight/User Voice

6. Aviation Resources and Contractor Oversight

7. Transition Property Management–Cross Enterprise

8. Government Flight Representation-Cross Enterprise

9. Publications Development (Training/Systems Data)

Product Fielding,
fleet resource
planning and
product
optimization,
product support,
property
management
“Not Maintenance”

10. Modification Line Oversight and System Acceptance

11. Rapid Reaction/Production

Incremental product
improvements, rapid
technology injection
off modernization cycle

12. Science and Technology Exploration

Next Generation

*Expected with C27J fielding



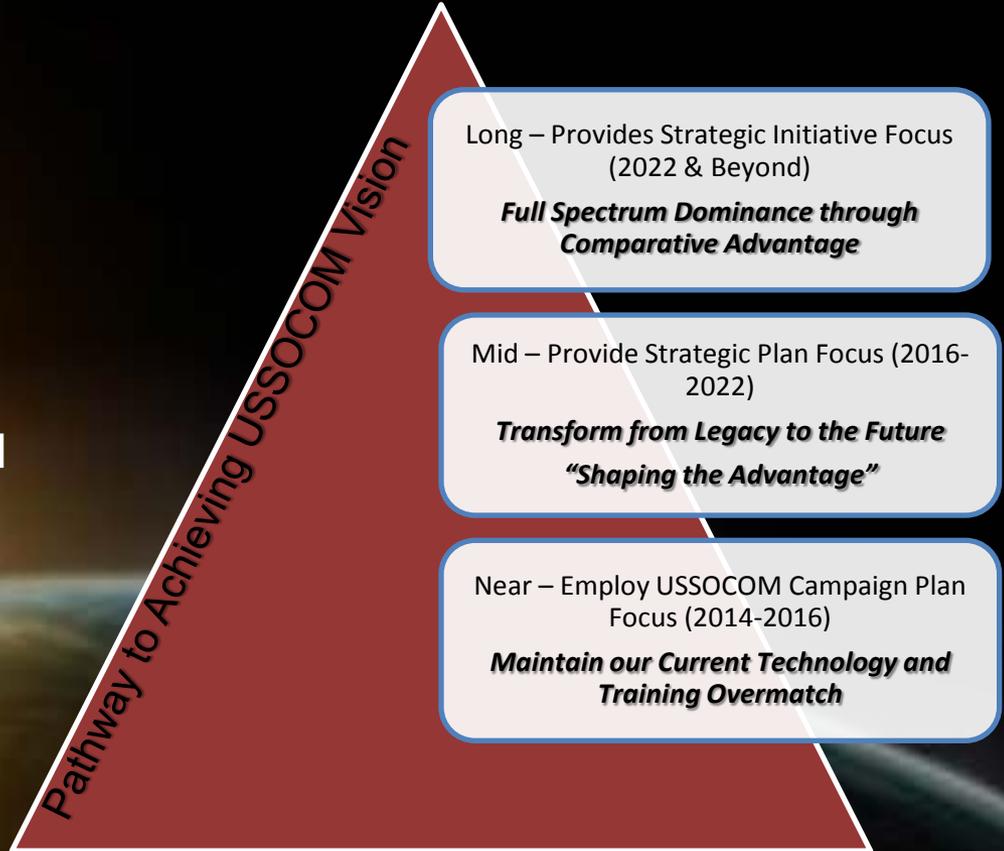
Army Special Operations Aviation

“Tenets and Vision”



SIMO executes its mission and accelerates the force by following four key acquisition principles:

- **Delivers capability to the user expeditiously;**
- **Exploits proven techniques and methods;**
- **Keeps Warfighters involved throughout the process; and**
- **Takes risk and manages it.**



“Provide the ground commanders the speed, agility, lethality, survivability, depth and networked SA to prevent, shape and win”



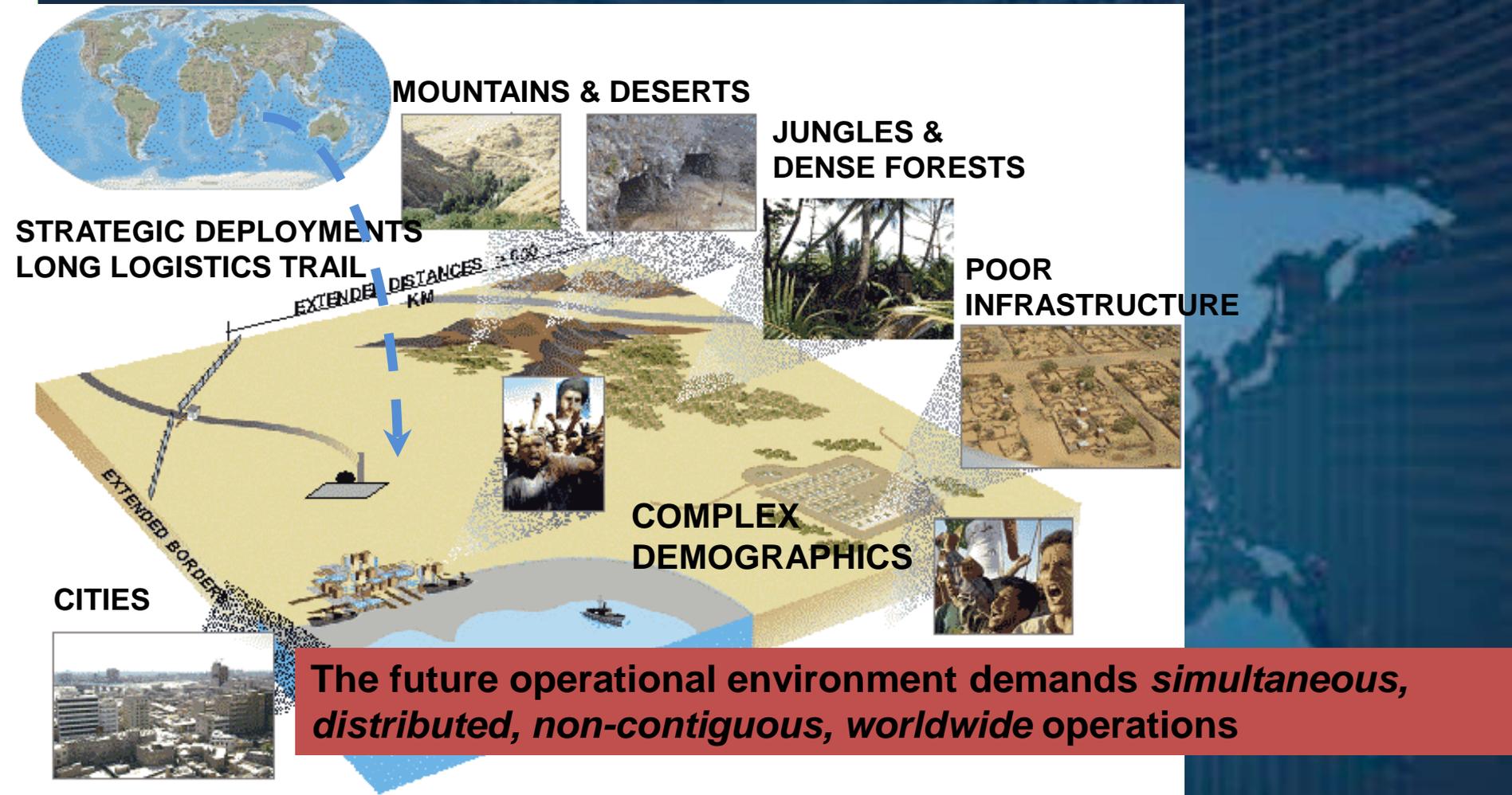
Army Special Operations Aviation SOF Tenets



- **Speed, Range, Payload**
 - >200-250KIAS
 - Worldwide deployable with Aerial Refuel
 - Ground Forces own the payload
- **Objective Maneuverability**
 - Effective maneuver on and around the objective (Air and Ground Element)
- **Lighter**
 - Fuel efficiency and greater payload
- **Modular and Reconfigurable**
 - Plug and Play
 - Common Backplanes and Avionics – interchangeable across platforms
- **Adaptable**
 - Design prevents the Technology from being an Achilles' Heal
- **Non-proprietary**
 - Government Purpose Rights



Joint Future Operational Environment



Increased reliance on global force projection by Army Special Operations Aviation



Our S&T Challenge



Problem Statements:

“I want vertical lift aircraft that fly faster, go farther and carry more stuff...,” while maintaining comparative advantage

**Brigadier General Clay Hutmacher,
Commander United States Army Special Operations
Aviation Command (Airborne)**

- Food for Thought: We need an affordable and effective integrated pilotage system across the SOF Aviation fleet, to enhance full spectrum operations, especially in degraded visual environments including integrated seamless networked solutions with effective maneuverability on the objective**



S&T Roadblocks



The biggest impediment for rapid insertion of technology into our aircraft is the platform specific, proprietary architectures that require us to develop, test and field unique solutions for incorporation of technology improvements



Ultimately, SOF Aviation platforms, must perform these tasks to standard, worldwide, in conditions ranging from standard sea level @103° F to high/hot (6K Pressure Altitude / 95° F) across the full spectrum of environmental conditions



Bridging the Valley of Death

RDTE Integration with the PPBE Process



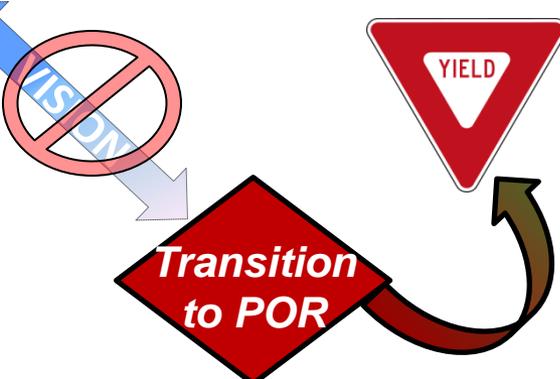
2nd Road Block

2. POM 17-21 Funding Requests submitted early in FY15 at the PM level

System PM: Necessarily risk-averse process



1. POM Planners unable to predict the future state of S&T with sufficient accuracy and confidence to develop specific low-risk program plans to fund transitions (assuming a JCIDS requirement exists in order to plan against)



3. S&T successes technically able to transition must endure >24-month POM lag or are addressed by displacing existing program efforts (program instability)

Can this be mitigated through recurring, persistent RDTE transition budgets (ie "transition ration")?



S&T: Necessarily risk-permissive process

Acquisition and PPBE processes



Current Technology Roadmap



| | HOSTILE FIRE INDICATION Detect/Defeat Threat Weapons, Disable Shooters | SIGNATURE MANAGEMENT Reduce Detection Radius, Disrupt Aiming | | | DEGRADED VISUAL ENVIRONMENT SYSTEM Operate Safely in Brownout, Whiteout, and IMC | INTEGRATED AIRBORNE NETWORKING SYSTEM Holistic Waveform Management |
|-----------------------------|--|---|---|---------------------------------|--|---|
| Current Capability | Detect and counter guided munitions with expendables | Exhaust Suppression (Infrared) | | | Flight Instruments, CAAS cueing | Federated Rover 6 and PRC-117 (Carry-On) Case-by-case MANET |
| Tech Path ↓ | Detect unguided projectiles, geolocate source, slave sensors | Reduction of visual signature | Reduction of radar signature; agile and cooperative jamming | Reduction of acoustic signature | DAFCS, synthetic vision for increased control and cueing | Integrated Waveforms & MANET', Federated Link 16 |
| | Detect aimed optics, rifle barrels; directed energy replaces expendables | | | | Fusion of DTED with imagery or EO, integrated cable warning and obstacle avoidance | Hybrid Optical/RF air-to-air links, Msn Planning, Airborne Mesh, Integrated Link 16 |
| | Dazzle shooters and potential shooters, disable RPG fuses prior to impact | | | | DTED, imagery, EO, RF, and laser image via HUD | Software Programmable Radios supporting single integration multi-solution set cross domain |
| Objective Capability | Disable guided and fused weapons prior to launch; surface fire feeds AOR targeting systems | Active signature manipulation; electromagnetic spectrum exploited for feints, saturation and surprise | | | Integrated Synthetic vision via HUD, expand portion of available of EM spectrum & data available to Crew Members | Fully Displayable, Modular, Air vehicle OFP de-synced Dynamic Tactical Airborne Network with Anti-Cognitive Jamming |



ARSOA S&T Interest Areas



| | | |
|---|--|---|
| <ul style="list-style-type: none">• Survivability<ul style="list-style-type: none">– Signature Reduction<ul style="list-style-type: none">* Acoustic, RF, IR– Aircraft Hardening– Redundancy– Speed & Range– Next Generation Active Protection | <ul style="list-style-type: none">• Situational Awareness<ul style="list-style-type: none">– Virtual Cockpit– UAS Associates– Degraded Visual Environment (DVE) Control– Sensor Fusion– Foliage Penetrating Sensors- GPS Denied High Accuracy Precision Navigation | <ul style="list-style-type: none">• Affordability<ul style="list-style-type: none">– On Condition Maintenance– Non-proprietary software– Commonality |
| <ul style="list-style-type: none">• Performance<ul style="list-style-type: none">– Hybrid Engines– Active Rotor Control/Coaxial– Swashplateless– Variable Geometry Rotors– Seamless Sea Based | <ul style="list-style-type: none">• Network<ul style="list-style-type: none">– GIG Compatibility– Multi-level Security– SW driven waveforms– Integrated Assured Comms– Seamless Operations (self-joining, self-healing)Anti Cognitive Jamming | <ul style="list-style-type: none">• Lethality<ul style="list-style-type: none">– Directed Energy– Scalable– Auto/Ai Target recognition– Selectable yield warheads |

Conclusion

Based upon the ARSOAC Priorities

- Key Areas of Engagement
 - Platform
 - Speed, Range, Payload
 - Maneuverability on the Objective
 - Mission Equipment
 - Survivability
 - Situational Awareness
 - Performance
 - Networking
 - Lethality
 - Affordability
- Solve tomorrows gaps through vision, leading edge technology, rapid fielding, employment and ultimately,

“Violence of Force”



Army Special Operations Aviation SOF Truths






- Speed**
 - >200-250KIAS
- Range**
 - Worldwide with Aerial Refuel
- Payload**
 - Ground Forces own the payload
- Lighter**
 - Fuel efficiency and greater payload
- Modular**
 - Plug and Play
- Reconfigurable**
 - Common Backplanes and Avionics – interchangeable across platforms
- Non-proprietary**
 - Government Purpose Rights
- Adaptable**
 - Design prevents the Technology from being an Achilles' Heal



ARSOA S&T Interest Areas

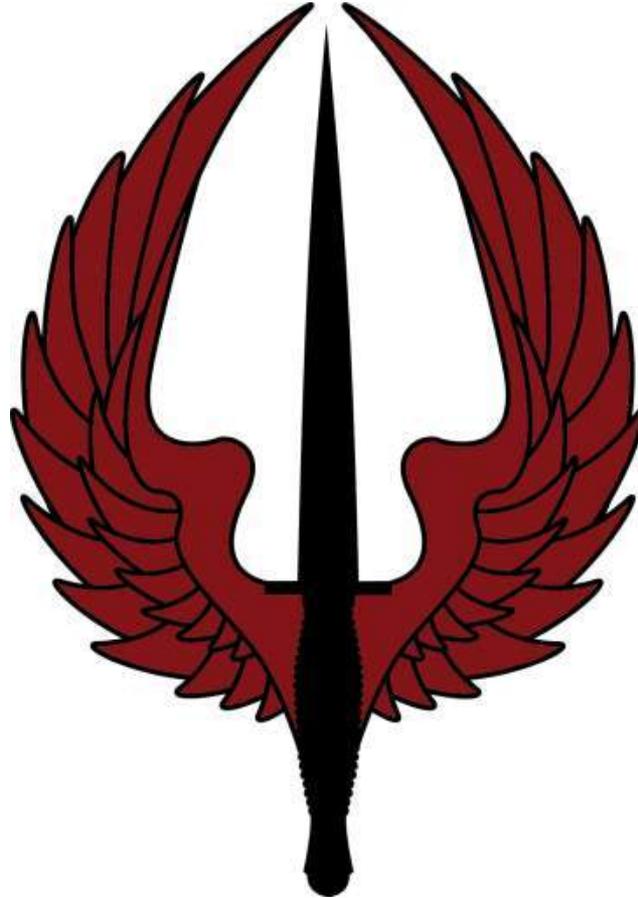


| | | |
|---|---|--|
| <ul style="list-style-type: none"> • Survivability <ul style="list-style-type: none"> – Signature Reduction * Acoustic, RF, IR – Aircraft Hardening – Redundancy – Speed & Range – Next Generation Active Protection | <ul style="list-style-type: none"> • Situational Awareness <ul style="list-style-type: none"> – Virtual Cockpit – UAS Associates – Degraded Visual Environment (DVE) Control – Sensor Fusion – Foliage Penetrating Sensors – GPS Denied High Accuracy Precision Navigation | <ul style="list-style-type: none"> • Affordability <ul style="list-style-type: none"> – On Condition Maintenance – Non-proprietary software – Commonality |
| <ul style="list-style-type: none"> • Performance <ul style="list-style-type: none"> – Hybrid Engines – Active Rotor Control/Coaxial – Washplateless – Variable Geometry Rotors – Seamless Sea Based | <ul style="list-style-type: none"> • Network <ul style="list-style-type: none"> – GIG Compatibility – Multi-level Security – SW driven waveforms – Integrated Assured Comms – Seamless Operations (self-joining, self-healing) – Anti Cognitive Jamming | <ul style="list-style-type: none"> • Lethality <ul style="list-style-type: none"> – Directed Energy – Scalable – Auto/Ai Target recognition – Selectable yield warheads |

VOLARE OPTIMOS
UNCLASSIFIED // FOUO
SIMO 19



United States Army Special Operations Aviation Command



VOLARE OPTIMOS