Program Executive Office Fixed Wing

**ISR - FIND**
- MQ-1C Gray Eagle
- MQ-9 Reaper
- RQ-20A Puma
- Scan Eagle
- Aerosonde
- JAVAMAN
- MC-12W
- U-28A/PC-12

**MOBILITY - INFILTRATE**
- CV-22 Osprey
- EC-130J Commando Solo
- C-146A Wolfhound
- C-145A Skytruck
- MC-130J Commando II
- MC-130H Talon II

**STRIKE - FINISH**
- MQ-9 Reaper
- MQ-1C Gray Eagle
- AC-130U Spooky
- AC-130W Stinger II
- AC-130J Ghostrider
- MC-12W
- MC-130J Commando II
- Stand Off Precision Guided Munitions

**TECHNOLOGY INSERTION**
- Sensors
- Mission Automation
- Survivability
- Kinetic Effects / DE
CY17 Execution Priorities

- Set the conditions for SOF C-130 recap success
- Provide timely airborne ISR solutions in support of theater and national SOF
- Develop and field capabilities that will permit SOF aviation to operate in the contested environments
- Pursue demonstrations and prototypes to address capability gaps
Airborne Intel, Surveillance, & Recon (AISR)

- **U-28A**
- **Scan Eagle**
- **JAVAMAN/MC-12W**
- **MQ9 Reaper**
**Manned ISR**

- **Capability Description**: Provide Tactical Airborne Intelligence, Surveillance, and Reconnaissance (ISR)
- **On-Going Efforts**: Missile Warning System Upgrades, Engine Infrared Suppression, IMINT and SIGINT Upgrades
- **Future**: Low Cost Modifications Focused on Communication System Upgrades

### Acquisition Strategy

- Operational System in Sustainment with Evolutionary Mission System Technology Insertions

### Periods of Performance

- 12 Months per Mission Design Series
  - U-28: 1 Nov - 31 Oct
  - MC-12: 15 Dec – 14 Dec

### Milestones

- None – In Sustainment

### Point of Contact

- 813.826.9482 (TILO)

### Funding

<table>
<thead>
<tr>
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<th>U-28</th>
<th>MC-12</th>
<th>JAVAMAN</th>
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<td>$228M</td>
<td>$49M</td>
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### Current Contract/OEM

- Sierra Nevada Corp (U-28)
- L3 Communications (MC-12/JAVAMAN)
**Next Generation ISR**

- **Capability Description:** Provides Next Generation of Tactical Airborne ISR In Support of Special Operations Forces
- **Ongoing:** Analysis of Alternatives (AoA) to Identify Potential Platforms and Systems
- **Future:** Material Solution Analysis; CDD; Risk Reduction Efforts; FY20 POM Preparation

**ACQUISITION STRATEGY**
- AoA Jul 16 – Jun 17
- Program Objective: Missionize / Sustain TBD Aircraft
- Design Approach: Modularized / Rapidly Reconfigurable Design

**PERIOD OF PERFORMANCE**
- AoA Jul 16- Jun 17

**MILESTONES**
- Completed ISR Study – ID’d 14 Gaps
- Completed AoA
- CDD
- Material Solution Analysis FY18 IQ

**POINT OF CONTACT**
- 813.826.9482 (TILO)

**FUNDING**
- FY17: $1M RDT&E

**CURRENT CONTRACT/OEM**
- Johns Hopkins University - Applied Physics Lab (JHU-APL) for NextGen ISR Study and AoA
Unmanned ISR

**Group I UAV**
- Max Payload: ~5 LBS
- Max Radius: ~10nm

**GROUP II UAV**
- Max Payload: ~10 LBS
- Max Radius: ~200nm

**GROUP III UAV**
- Max Payload: ~90 LBS
- Max Radius: ~1000nm

**GROUP IV UAV**
- Max Payload: ~1150 LBS
- Max Radius: ~1400nm

**GROUP V UAV**
- Max Payload: ~3750 LBS
- Max Radius: ~10000nm
• **Capability Description:** SOCOM MQ-1C and MQ-9 Aircraft are Armed, Multi-Mission, Long-Endurance Remotely Piloted Aircraft That Provide a Unique Capability to Find, Fix, and Finish functions through Intelligence Gathering, Coordination, and Reconnaissance Against High-Value, Fleeting, and Time-Sensitive Targets

• **On-Going Efforts:** 24 Currently Active Modification Projects

• **Future:** Increased SIGINT capabilities; Improved Full Motion Video sensors; Reduced Detection capabilities; Improved Weather Mitigation capabilities

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**ACQUISITION STRATEGY**

- Evolutionary Acquisition Program that Provides Improvements to MQ1C and MQ-9 UAVs, Ground Control Stations, and Training Systems, Mission Payloads, Aircraft Weapons Integration and Modification

---

**PERIOD OF PERFORMANCE**

- Various

---

**MILESTONES**

- Post Milestone C, Tech Insertion and Sustainment

---

**POINT OF CONTACT**

- 813.826.0549 (SAM)

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**FUNDING**

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*Pending Congressional Add and OCO Requests

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**CURRENT CONTRACT/OEM**

- General Atomics (MQ-1C, MQ-9)
- Raytheon (FMV Sensor)
- Various C2/HMI, SIGINT, and Weapons Vendors
Evolutionary Acquisition Programs that Deliver, Integrate, and Qualify SOF-Unique Mission Kits, Mission Payloads, Air Vehicle Enhancements, and Ground Station Upgrades

Contractor Owned and Operated (MEUAS)

Government Owned and Operated (SUAS/MTUAS)

Various

Post Milestone C (SUAS/MTUAS/MEUAS)

Capability Description: Runway Independent Launch/Recovery and Modular/interchangeable Payloads

On-Going Efforts: Electro Optical/Infrared, SIGINT/EW, and Communications Relay Payloads Interoperable with Joint and SOF Architectures

Future: Reduced Size, Weight and Power; Small Footprint Launch/Recovery; Type 1 Encryption

ACQUISITION STRATEGY

PERIOD OF PERFORMANCE

MILESTONES

FUNDING

CURRENT CONTRACT/OEM

POINT OF CONTACT

813.826.9482 (TILO)

Various

Post Milestone C (SUAS/MTUAS/MEUAS)

FY17

SUAS $30M

MTUAS $83M

MEUAS $209M

FY18

SUAS $9M

MTUAS $67M

MEUAS $147M

AeroVironment (Puma AE)

Insitu (Scan Eagle)

AAI (Aerosonde)
Special Applications for Contingencies (SAFC) Develops and Integrates Technology and Payloads
- Evolutionary and Spiral-Based for Technology Insertion and Low Volume Procurement for UAS
- 21 On-Going Projects: Payload Development, Testing, Evaluation and Demonstration

**ACQUISITION STRATEGY**
- Matures technologies for transition to UASs
- Employs multi-phase development approach to take a product from initial concept to transition onto a platform

**PERIOD OF PERFORMANCE**
- Various

**FUNDING**
- SAFC FY 17 Funding 21.549M
- SAFC FY 18 Funding 22.082M

**MILESTONE**
- Multiple

**CURRENT CONTRACT/OEM**
- Multiple

**POINT OF CONTACT**
- 813.826.9482 (TILO)
Integrated Strike Programs

- Dual EO/IR Sensors
- SOPGM Door
- Battle Management System MOP
- LSDB
- AC-130J Block 20
- SDB
- AC-130W Block 20
- Griffin
- Medium Caliber Gun
- Large Caliber Gun
- Dual EO/IR Sensors
- Integrated Strike Programs
- MOP
- Medium Caliber Gun
- Large Caliber Gun
AC-130W Stinger II

- **Capability Description**: Modified MC-130H with a Precision Strike Package (PSP) to deliver Close Air Support (CAS) and Air Interdiction (AI) missions
- **On-Going Efforts**: IR Suppression, Helmet Mounted Display, Improved Crew Comms, and Hellfire
- **Future**: Enhanced Defensive Countermeasures and Small Glide Munition

**ACQUISITION STRATEGY**
- Modified 12 MC-130W Aircraft with Precision Strike Package
- Currently maintaining and operating 9 AC-130W (3 retired Mar 17)

**PERIOD OF PERFORMANCE**
- Various

**MILESTONE**
- Post MS B, Engineering and Manufacturing Development
- Complete Operational Utility Evaluation
- Block 20 Deployment – Fall 2016

**CURRENT CONTRACT/OEM**
- ATK (30mm Gun)
- L3 TCS (Installation)
- L3 Wescam (FMV Sensor)
- L3 ForceX (Software)
- NSWC Dahlgren (PGW Systems)
- SNC (MOP/SOPGM Door)

**FUNDING**
- FY17 $16M
- FY18 $10M

**POINT OF CONTACT**
- 813.826.9482 (TILO)
**AC-130J Ghostrider**

### Capability Description
Modified MC-130J with a Precision Strike Package (PSP) to deliver Close Air Support (CAS) and Air Interdiction (AI) missions.

### On-Going Efforts
Started Block 20 IOT&E, IOC on track for end of FY17, Block 20+ DT Jun 17 (Combat System Officer Station, Special Mission Systems and Defensive System Upgrade)

### Future
Improved Defensive and Sensor Capability, Additional Weapons Integration, Improved Crew Situational Awareness

### ACQUISITION STRATEGY
- ACAT II production program to recapitalize all legacy AC-130s. AC-130J provides precision direct action targeting support for primary missions of CAS and AI.

### PERIOD OF PERFORMANCE
- Various

### MILESTONES
- Post Milestone C, Production, Tech Insertion and Sustainment

### POINT OF CONTACT
- 813.826.9482 (TILO)

### FUNDING
- FY17 $259M
- FY18 $270M

### CURRENT CONTRACT/OEM
- ATK (30mm Gun)
- Lockheed Martin (Installation)
- L3 Wescam (FMV Sensor)
- L3 ForceX (Software)
- NSWC Dahlgren (PGW Systems)
- SNC (MOP/SOPGM Door)
## Stand Off Precision Guided Munitions (SOPGM)

### ACQUISITION STRATEGY
Commodity procurement or limited development of SOF-unique precision guided munitions and integration of service common precision guided munitions onto SOF platforms to meet operational and training requirements.

### PERIOD OF PERFORMANCE
- **Various**

### MILESTONES
- Integration, Production and Sustainment

### POINT OF CONTACT
- 813.826.9482 (TILO)

### FUNDING
- **FY17** $97M
- **FY18** $78M*

*Pending Congressional Add and OCO Requests

### CURRENT CONTRACT/OEM
- Boeing Defense
- Dynetics
- Lockheed Martin
- Raytheon Missile Systems

### Capability Description
- Procure and develop Precision Guided Munitions (PGM)

### On-Going Efforts
- Integrating Small Diameter Bomb II, Small Glide Munition and Enhanced Paveway II on SOF platforms

### Future
- Investigate SMART 105, Guided 30mm and Weapon Data Links

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**Note:** FY18 funding is pending Congressional Add and OCO Requests.
SOF C-130s, CV-22, and Mission Systems

- MC-130H
- SMS
- MC-130J
- Silent Knight Radar
- CV-22
- Color Helmet Mounted Display
- EC-130J
- Low Cost Mod (Link 16)
**Capability Description:** Modified C-130Js to Perform Low-level Infil/Exfil, Detect and Deny RF Threats, Airdrop, Resupply and In-Flight Refueling

**On-Going Efforts:** Radio Frequency Countermeasures, Terrain Following Radar and Airborne Mission Networking

**Future:** Automate SOF Mission Systems to Reduce Aircrew Workload, Enhance Capability for Ops in Denied Airspace

---

**ACQUISITION STRATEGY**
- Post-production Modifications to New Aircraft Recapitalizing Legacy Fleet

**PERIOD OF PERFORMANCE**
- Various

**MILESTONES**
- Milestone B: Terrain Following Radar
- Milestone B: Airborne Mission Networking
- Milestone B: RF Countermeasures

**FUNDING**
- FY17: $56M, $39M, $8M, $40M
- FY18: $49M, $88M, $9M, $57/55

**CURRENT CONTRACT/OEM**
- Lockheed Martin (C-130J, Inc3)
- Lockheed Martin/Raytheon (MCTF)
- BAE (RFCM)

**POINT OF CONTACT**
- 813.826.9482 (TILO)
# C-130 Modifications

<table>
<thead>
<tr>
<th>ACQUISITION STRATEGY</th>
<th>PERIOD OF PERFORMANCE</th>
<th>MILESTONES</th>
</tr>
</thead>
</table>
| • Operational System in Sustainment with Evolutionary Technology Insertions | • Various | • Post Milestone C: MC-130H  
• Milestone B: EC-130J; De-Mod & RAMS |

<table>
<thead>
<tr>
<th>POINT OF CONTACT</th>
<th>FUNDING</th>
<th>CURRENT CONTRACT/OEM</th>
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</table>
| • 813.826.9482 (TILO) | • FY17: $26M  
• FY18: $20M | • Various |

**Capability Description:** Sustainment Mods to Improve Reliability and Maintainability, Correct Deficiencies, Address Obsolescence, Incorporate Mission Enhancements, and Critical Safety Changes

**On-going Efforts:** Radar Upgrades, Avionics Upgrades, Gun System Improvements, Structural Improvements, Military Information Support Operations Capability Replacement, and Installation of the SOF-Unique Portions of the C-130J Block Cycle Software and Hardware Upgrades

**Future:** Install Emergency Equipment Bins, Light Weight Armor for Paratroop Doors, Hostile Fire Sensor Operational System in Sustainment with Evolutionary Technology Insertions
CV-22B Osprey

- **Capability Description**: Provides Long Range, High Speed, All-Weather, Infil/Exfil, and Resupply of Teams in Hostile, Denied, and Politically Sensitive Areas in a Single Period of Darkness
- **On-going Efforts**: Silent Knight Radar (SKR), Color Helmet Mounted Display, Suite of Integrated RF Countermeasures (SIRFC) upgrades, and Search/Landing Light
- **Future**: Defensive Weapon System, Airborne Mission Networking, Open Architecture, and Mission Automation

### ACQUISITION STRATEGY
- Operational Systems in Sustainment With Evolutionary Technology Insertions

### PERIOD OF PERFORMANCE
- Various

### MILESTONES
- Post Milestone C: Production and Sustainment Through a Joint Performance Based Logistics Contract
- Milestone B: SKR Integration

### POINT OF CONTACT
- 813.826.9482 (TILO)

### FUNDING
- FY17: $40M
- FY18: $56M

### CURRENT CONTRACT/OEM
- Bell-Boeing Aircraft Prime (OEM)
- Rolls Royce Engine Prime (OEM)
- Raytheon IN (Software Support)
- Multiple Contracts (Low Cost Mods)
- Final Aircraft Delivery in 2020
**NSAv and AvFID**

- **Capability Description:** Non-Standard Aviation (NSAv) supports worldwide SOF Tactical/Strategic missions
- **Aviation Foreign Internal Defense (AvFID)** provides Tactical Airborne ISR in Support of SOF training Partner Nation Aircrews
- **On-going Efforts:** Cockpit, communication & cabin upgrades
- **Future:** Continued avionic obsolescence avoidance & compliance

**ACQUISITION STRATEGY**
- NSAv – Utilizes 645 Aeronautical Systems Group to procure aircraft, necessary training systems, equipment, and aircraft upgrades/modifications. Single contractor
- AvFID – C-145 sustainment

**PERIOD OF PERFORMANCE**
- 12 Months
  - NSAv: 1 DEC 2016 - 30 NOV 2017
  - AvFID: 1 May 2017 – 30 Apr 2018

**MILESTONES**
- NSAv
  - Delivered aircraft 18, 19 and 20.
  - Completed upgrade of six aircraft from Block 10 to Block 20 configuration.
  - Awarded Weapon Systems Trainer contract
- AvFID – In sustainment

**FUNDING**
- NSAv FY17: $111M
- NSAv FY18: $112M
- AvFID FY17: $8M
- AvFID FY18: $8M

**CURRENT CONTRACT/OEM**
- Sierra Nevada Corp (NSAv)
- Sierra Nevada Corp (AvFID)

**POINT OF CONTACT**
- 813.826.9482 (TILO)
FW Technology Insertion Process and Enablers

Lab Capabilities

User Requirements

PEO-FW Tech Insertion
Identify Innovative Solutions

Tech Insertion
Roadmaps

POM & Budget

Fiscal Year Priorities
Funding
PM Tracking
Contract Vehicle
Schedule
Technology maturation

Transition

Industry Engagement

BAAs
OTAs
CRADAs

Capability Collaboration Events

Contracts / Agreements

Cougar Demo Platform

Funding Resources

PSP
SBIR
JCTD
SAFC
Eng Analysis
RIF
(etc.)
Enablers

- Flexible Demonstration Platform for:
  - Requirement Validation of Programs of Record
  - Technology Advancement, Transition, and Insertion
  - Risk Reduction
  - TTP Development

12 Demos, 36 Flights, ~129 Test Hours in FY17

- PEO-FW Engaging/Collaborating on Focused Problem Set with Industry, Government Labs, and Academia

- Technology Push with Direct User Participation/Feedback
  - Requirements/Capability Gap definition
  - White Boarding/Brainstorming/Crosstalk
  - White Paper/Product pitch
  - Example: “GPS out of the Box” event

• 5 Events Completed in 1 Year
**Strike / Munitions / Directed Energy**

<table>
<thead>
<tr>
<th>FY18</th>
<th>FY19</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
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<td>AC-130J TOBS</td>
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<td>Small Glide Munition</td>
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<td>Joint Air to Ground Munition</td>
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<td>Selectable Effects Munitions</td>
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</table>

- **Non-SOCOM Effort**
- **SOCOM S&T Effort**
- **SOCOM Effort**
AC-130J High Energy Laser

- **Objective:** Demonstrate a Precise Airborne Low Kinetic Weapon System Capable of Ground Based Scalable Effects

- **Approach:**
  - Utilize existing USG components (i.e. Beam Control/ Beam Director/Laser) to demonstrate laser beam control in a relevant environment
  - Develop ICDs for laser system integration
  - Develop deliberate plan for industry laser integration
  - Build “laser agnostic” Beam Director sub-system capable of accepting (~2-3) industry lasers

- **Outcome:**
  - Inform DoD on Performance of Airborne Electric High Energy Lasers
**HEL Approach**

**Beam Control Risk Reduction**

- **BMS**
  - Interface

- **Supporting Infrastructure**
  - **HBDS Beam Control System (Refurbished)**
  - Interface

- **4kW HEFL**

**Laser Agnostic Industry Participates**

- **BMS**
  - Interface

- **Supporting Infrastructure**
  - **New Beam Control System**
    - Interface
  - **Interface**

- **IRAD Laser**
  - Interface

*New Development* | *Modify* | *Reuse* | *Contractor Asset*
## AISR /Sensors

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<td><strong>Small UAS / Medium Tactical UAS</strong></td>
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<td><strong>Manned ISR Mods (Javaman, U-28, MC-12, DHC-8)</strong></td>
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<td><strong>EC-130J Removable Airborne MISO System (RAMS)</strong></td>
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### Platform Integration
- Color Night Vision SBIR
- Manned ISR AoA
- 5” & 3” AFRL Gimbal
- SBIR Phase II 20” Cape in 15” Ball

### Development & Testing
- Sensor Technology for Group I-III UAS (SAFC)
  (Capability Improvements, Reduced SWaP, & Multi-INT Fusion)

### Future Capabilities
- Improved RADAR
- Concealed, Weather-Degraded, Complex Environ. Ops
- 3D, Multi-Color, >HD(4K) EO/IR
- Foliage Penetration (FOPEN)/LIDAR
- EW / Multi-INT
- Sensor Fusion
- Wide Area Motion Imagery (WAMI)
Survivability

FY18 | FY19 | FY20 | FY21 | FY22 | FY23
--- | --- | --- | --- | --- | ---
MC-12 IRSS | | | | | |

Platform Integration

- MC-12 IRSS
- C-130J DCM
- AC/MC Radio Frequency Counter Measures (RFCM)
- MC-130J/CV-22 Terrain Following

Development & Testing

- Acoustic Suppression SBIR
- Acoustic Characterization
- AFSOC Survivability Study
- Special Activities
- FW Survivability Demos
- Future Capabilities
  - Denied PNT Technology
  - Denied Area Navigation
  - Threat Warning / CM Fusion
  - Acoustic Signature Management
  - Infrared Signature Management
  - RF Signature Management
  - Low Signature Comm’s Antenna

Non-SOCOM Effort | SOCOM S&T Effort | SOCOM Effort
# Mission Automation

## Development & Testing
- **UAS Modular Payload**
- **Open Architecture & PED Open Interface**

## Platform Integration
- **Airborne Mission Networking**

<table>
<thead>
<tr>
<th>FY18</th>
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<td>MC-130J Tactical Flight Management</td>
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</table>

## FY2022 - FY2023

### Future Capabilities
- C2G Mission Data Transfer / Cross Domain Data Transfer
- Mission Route-Re-planning / Data Fusion
- Enhanced/Improved Aircraft Comms (Speech-to-Text/Text-to-Speech)
- 3D / Spatial Sound / Haptic Feedback
- Machine Intelligent Processing
- Mission Networking Tech
- PED Automation – Detection & Queuing
- Smart Integration of Federated Sys

---

**Non-SOCOM Effort**  
**SOCOM S&T Effort**  
**SOCOM Effort**
Mission Automation Event Progress

- Hosted over 60 attendees across Industry, academia and Government including AFSOC crew members from AC-130J, MC-130J, U-28 and MQ-9

- Identified Top 3 Thrust Areas for Further Action:
  - C2G Mission Data Transfer / Cross Domain Data Transfer
    - Goal: C2G Mission Continuity – Utilize common framework for entire process
    - Status: Investigating Security requirements / Implications
  - Mission Route Re-planning / Data Fusion
    - Goal: Provide Actionable recommendations to crew for threats, weather, routes
    - Status: Conducted Industry Day, Identified 4 potential solutions for follow-on evaluation
  - Enhanced / Improved Aircraft Communications Monitoring (Speech-to-Text/Text-to-Speech, keywords recognition, prioritizing channels) using Machine Learning
    - Goal: improved AC communications both internal to crews and incoming to AC
    - Status: Gathering Mission Data for Analysis
Data Flow Concept

Data Generation

Automation Opportunities

Data Mining

Adjust Parameters

Model

Predict

Learn

Compare

AUTOMATED DATA = IMPROVED CREW RESOURCE MANAGEMENT
AC-130 Example

Potential Data

| Flight data (flying hours, systems performance, radar, position) |
|-----------------|-------------------------------------------------------------|
| Strike Sensor video feeds & ops audio | 3-D virtual scenes |
| Geo-referenced images | Target identification |
| Metadata fusion | Change detection |
| Hyperspectral data exploitation | Camo and decoy detection |
| Battle Management System Diagnostics | In flight maintainer notifications |
| Aircraft Data Bus Diagnostics | Remote troubleshooting |
| Audio recording (radio/ICS) | Autopiloted routes and weapon profiles |
| Engagement Logging | Automated post flight debriefing storyboards & BDA |
| Threats & Intelligent Broadcasts | Enhanced ISR for map/HMD/HUD |
| No Strike Lists | Threat alerts and warnings |

Data Products & Mission Automation

- Diagnostics, training and improve mission proficiency
- 3-D virtual scenes
- Target identification
- Change detection
- Camo and decoy detection
- In flight maintainer notifications
- Remote troubleshooting
- Autopiloted routes and weapon profiles
- Automated post flight debriefing storyboards & BDA
- Enhanced ISR for map/HMD/HUD
- Threat alerts and warnings
Next Steps

- Identify Data Collection Mechanism
- Build Data Repository
- Secure Appropriate Classification Approval
- Establish Vetted Vendor Pool
- Vendor(s) Conduct Mining Analysis
- Stakeholders Establish Objectives & Milestones
- Execute Coordinated Review Sessions
- Validate & Verify Automation Opportunities with Stakeholders
- Inject Automation Solutions into Test Aircraft
QUESTIONS?