BBP 3.0: Incentivize Innovation in Industry and Government

- Increase the use of prototyping and experimentation
- Emphasize technology insertion and refresh
- Use modular open systems architectures to stimulate innovation
FUTURE CAPABILITY FOCUS AREAS

- Modular Payloads
- Mission Automation
- Enhanced Survivability
- Kinetic Effects
- Directed Energy
- Group 1-3 UAS Systems Tech
- Open Systems Approaches

Do-328 Rapid Demonstration Platform
MODULAR PAYLOADS

Why:
• Tailored, Adaptable, and Reconfigurable Capabilities for Modular Payload Development and Integration for Groups IV and V UAS, Manned ISR, and Strike Platforms

Objective:
• Demonstrate Modular, Multi-Function, Multi-Modal Payloads with Versatile Architecture
• Reduce Size, Weight, and Power (SWaP)

Applicable Technologies:
• Higher Res (4K+), 3D, and Multi-Color EO/IR
• Multiple Moving Target Tracking
• Medium/Wide Area Motion Imagery (MAMI/WAMI)
• Foliage Penetration (FOPEN)/LIDAR
• Real-Time FOPEN/LIDAR

Benefit:
• Improve Concealed, Weather-Degraded, Complex Environments Operations
• Track Hostiles and Friendlies at Night in Urban, Triple Canopy During Thunderstorm

FOPEN/LIDAR
EC-130J
JAUDIT Demo (2014)

EC-130J
MTS-B Demo (CRADA) (2014)

WAMI U-28 MX-15
Dragon Eyes Demo (CRADA) (2015)
MISSION AUTOMATION

Why:
• Smart Integration and Automation is Crucial to Maximizing the Effectiveness of a Capacity Limited Platform or Small Ground Team

Objective:
• Detect/Understand Humanly Indiscernible Objects, Events, and Contextual Relationships at Machine Speeds

Applicable Technologies:
• Workload Reduction
• Machine Intelligent Processing
• Tactical Flight Management
• Smart Integration of Federated Systems

Benefit:
• Reduced Workload and Streamlined Augmentation to Manage/Share Complex Data
• Improved Situational Awareness/Decision Making for the Crew
ENHANCED SURVIVABILITY

Why:
• Evolve Threat Detection and Counter Measure Capability Against Increasingly Lethal 21st Century Threat and Non-Permissive Environments

Objective:
• Signature Management (Acoustic, IR, RF, Visible)
• Situational Awareness with Full Spectrum Threat Warning & Counter Measures

Applicable Technologies:
• Acoustic/IR/RF Signature Reduction
• GPS-Degraded Operations
• Low Signature Communications/Antennae
• Multi-Sensor Pod
• Mission Networking and Enhanced Awareness
• VTOL Threat Suppression

Benefit:
• Versatile Innovations for Multiple Functions With Wide Range of Effects in Denied and GPS-Degraded Environments
KINETICS EFFECTS

Why:
• Provide Wide Range of Desired Lethal and Non-Lethal Effects

Objective:
• Demonstrate Improved Accuracy and Lethality
• All Weather Capability
• Reduce Size, Weight, and Power
• Reduce Life Cycle Costs

Applicable Technologies:
• 105mm Precision Guided and Fuzes
• Improved Lethality 30mm/105mm
• Wind Sensing
• Loitering Munitions
• On-the-fly Programmable/Selectable Munitions Fuzes and Effects

Benefit:
• Improved First Pass Accuracy and Lethality
• Minimize Collateral Damage

Examples:
• CRADA With Small Glide Munition, Tactical Off Board Sensor (TOBS), AN/ASQ-236
DIRECTED ENERGY

Why:
• Provide a Range of Offensive and Defensive Desired Effects with Directed Energy (DE)

Objective:
• Demonstrate Operationally Suitable DE Prototype
• Establish Engineering and Airworthiness Criteria for Testing and Fielding
• Aid in Develop Concept of Operations (CONOPS) and Concept of Employment (CONEMP) for DE

Applicable Technologies:
• High Energy Laser (HEL)
• Power Management
• Aiming and Focus Turret

Benefit:
• Minimize Collateral Damage and Signatures

Next Steps:
• Assess Currently Available Technologies
• Determine Tech Readiness Levels
• Provide Advocacy for Service Efforts (AF, Navy, Etc…)
• Focus on High Risk Areas
• Begin Transition Planning/Aircraft Integration
**GROUP 1-3 UAS SYSTEMS TECHNOLOGIES**

**Why:**
- Grow Capability for Group 1 – 3 UAS

**Objective:**
- Identify Viable Options
- Measure SWaP Constraints/Tradeoffs
- Demonstrate Operationally Suitable

**Applicable Technologies:**
- EO/IR, EW, LIDAR, Hyper-Spectral
- Random Compression Sampling
- Open Source Autopilots
- Wide Band Data Links/Mini-Directional Antennas with Waveform
- Improved Power Plants

**Benefit:**
- Assets Under Direct Control of Tactical Units - Quickly and Dynamically Tasked
- Location Relative to the Fight Allows for Improved Response Time
- Leaning Forward to Meet Increasing Power and Data Requirements on SWaP Improvements of Advanced Payloads
OPEN SYSTEMS APPROACHES

Why:
- Open Standards, Interfaces, and Protocols to Support Interoperability

Objective:
- Demonstrate Modular, Flexible, and Versatile Architecture for Rapid Integration and Reconfiguration Of Aircraft / Mission Systems

Applicable Technologies:
- Air Force Rapid Capabilities Office - Open Mission Systems
- Navy PMA 209 - Future Airborne Capability Environment (FACE™)
- Navy Battle Management System
- Common Launch Tube

Benefit:
- Innovative Technology Insertion
- Faster Periodic Technology Refresh Cycles

Open Mission Systems (OMS)
Key-interface definition + common composition rules = “acquisition efficiency”

Future Airborne Capability Environment
FACE is trademark of the Open Group

Common Launch Tube (CLT)
Do-328 DEMO PLATFORM
ISR-Survivability-Comms-Weapons

- Do-328: 335 Knots, 31k Ceiling, 1150 Mile Range
- Two External Sponsons (750 Lbs Max)
  - BRU-15 Allows 14” Lug Space Mounting
  - Aero-1 Adapter Allows For 30” Lug Mounting
- Modular Fuselage Antenna Bays (1 Top / 2 Bottom)
  - Flexible Mounting Brackets to Accommodate Various Size and Weight Antennas, 4 Feeds/Bay
- 1x UHF/VHF/SATCOM “Mission” Antenna
  - Connected to PRC-117G Radios in the Cabin For PT/CT LOS and BLOS Communications
- KU-Band BLOS Satellite Data Link System
- Nose Available for Antenna/Sensor Mount
- 2 RF Transparent (<3.0 Ghz) Pods
  - 300 lbs Payload/Payload Space = 90.7” X 18”
  - Aircraft Seat Track for Easy Mounting of Eqpt
Do-328 DEMO PLATFORM

ISR – Survivability – Comms - Weapons

- Two Reconfigurable Operator Workstations
- Radio and Equipment Racks
- Seven Quick Disconnect Panels (Qdps) with Power, Ethernet, GPS And 1553 Data Bus Ports Throughout the Mission Cabin
  - LN-251, SAASM Capable INS/GPS with Native 1553
  - ARINC-429, RS-422/232, 1553 Databus, Ethernet
  - 48-port Ethernet Switch with VLAN Capability
  - 16-port GPS Splitter Via a Mission Only Antenna
  - AB3000 Ruggedized Protocol Converter
- Multi-intercom System for Pilots & Crew
- Instrumentation Disconnect Panel
- Native A/C Data Via Air Data Computer Wiring
- Cable Pass-thru for External Stores
- Mission Cabin Orange-wire Trays for Routing Cables to Equipment Throughout Cabin with Secure Separation Capability
Do-328 DEMO PLATFORM
Pathways for Industry

Customer Advocates
USSOCOM Components

S&T Advocates
AFRL - AFLCMC

SOF AT&L CRADA Tasks
PEO-FW - S&T

Monthly Gov’t Stakeholders Meeting
Determine Priorities, Scheduling, & Funding

6-10 Demos per Year
Proof of Concepts, Rapid Acquisitions, TTP Development, Requirements Development, etc.