U.S. ARMY

DEVCOM SOLDIER CENTER

U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND SOLDIER CENTER

PIA Government Systems Committee **Personnel Airdrop Science and Technology**	**22 FEBRUARY 2024**

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INTRODUCTION

- **Discussions today by Government officials involved in the 3rd Party Collections Services Acquisition should not be considered a guarantee of the Government's course of actions in preceding with the requirement**

- **The information shared today reflects current Government Intentions and is subject to change based on a variety of circumstances. The formal solicitation, when issued, is the only document that should be relied upon in determining and responding to the Government's requirements**

- **Any costs incurred prior to receipt of a contract signed by the contracting officer is at your own expense**

- **No recording devices are allowed during this presentation**

ARMY PERSONNEL AIRDROP S&T

- **Static Line Enhancements (SLE)** Explore technologies to support modernization of T-11 and inform requirements: canopy control/geometry modification, rear deployed reserves, reduced weight/bulk canopies

- **Next Generation Static Line Parachute (NGSL-P)/T-12** Support NGSL-P/T-12 A-CDD development; mature Gov't design(s) and competitive industry development of T-11 replacement parachute system

- **Combination High Altitude JPADS and Personnel Airdrop** Increase safety of combination airdrop through mission planning, communications and training support tools

- **Personnel Infiltration/Exfiltration System (PIES)** Powered paragliders for single Soldier & equipment (300 lbs, 250 kms); mission planning tool and waypoint navigation

- **Canopy Flight Assistance** Develop technologies to assist users with canopy flight to maximize offset

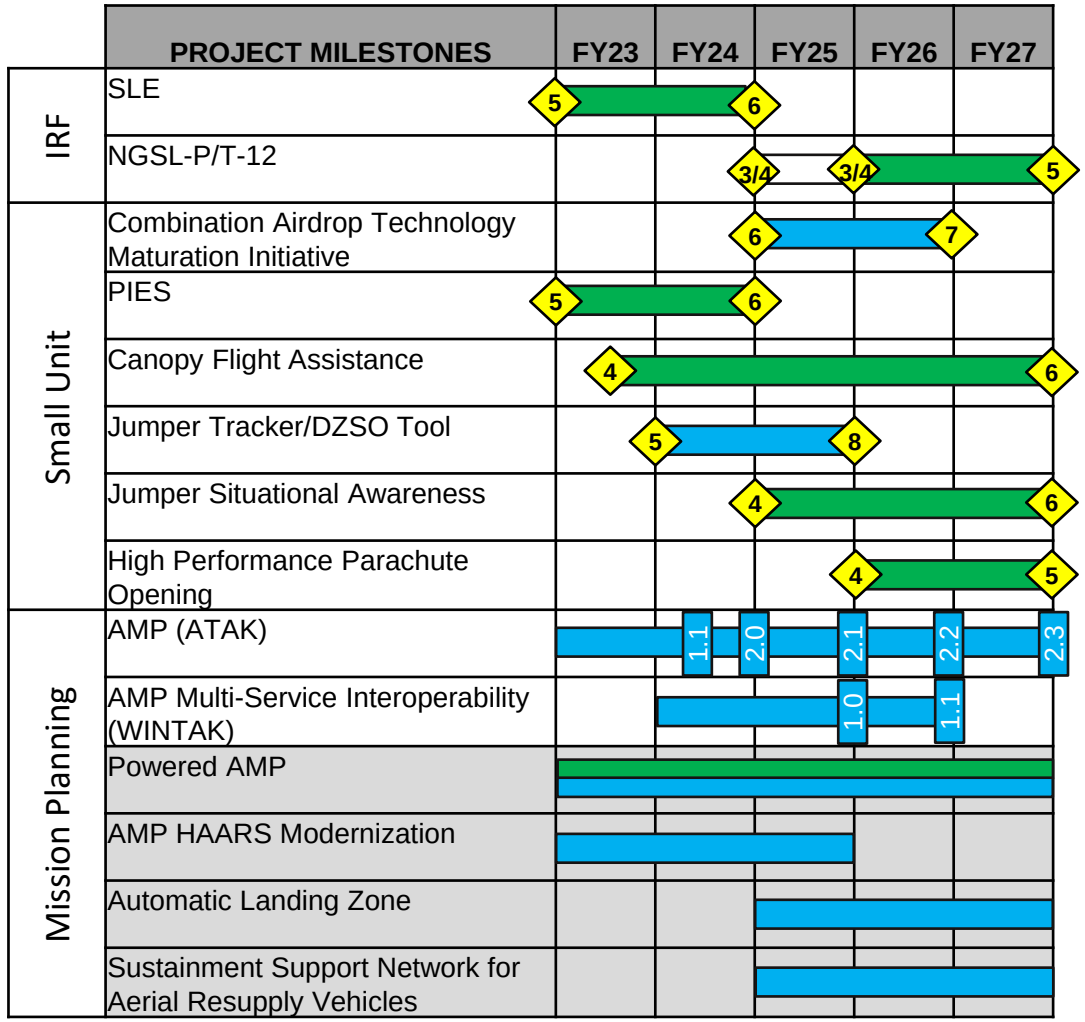
- **Jumper Tracker** DZSO SA tool, assist with jumper tracking and status, auto notification of potential malfunctions or injuries

- **Jumper Situational Awareness** Assess potential technology solutions to increase jumper performance: updates to UI/UX, HUDs, O2 integration

- **High Performance Parachute Opening** Increase reliability of parachute deployment of higher aspect ratio canopies/increased altitudes

- **Airdrop Mission Planner (AMP)** Accurate, easy to use mission planner for cargo and personnel

- **AMP Multi-Service Interoperability** Support planning and conduct of joint airdrop missions; shared mission profile/solution



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STATIC LINE ENHANCEMENTS

- **Purpose:** Develop personnel airdrop enhancements that save lives while enabling rapid Warfighter insertion for the Joint Forcible Entry and personnel infiltration missions
- **Why:**
  - Combined size/weight of Soldiers and Individual Equipment have increased, resulting in a reduction of combat power
  - Desire for reduced exposure through more rapid deployment/stabilization and lower exit altitude
- **Description:** Research and development focused on the following
  - Alternative deployment methods (main & reserve)
  - Reduction of altitude loss before main deployment
  - Reduction of the system weight and size
  - Improved harness comfort/weight distribution
- **Status:**
  - Market Research: Industry Demonstration and Industry Day/Request for Information (RFI) in FY21, 1QFY24
  - Seating and Harness Studies: data collection to characterize loss of paratroopers and current harnesses
  - Concepts to inform future systems: deployment methods, modification/control of parachute during descent, alternative materials for harness/canopy construction

RFI – 1QFY24

- **Link: https://sam.gov/opp/abce64d13ea942549c1f2b561d744aa0/view**
- **Desired Features:**
  - Reduce the time for a paratrooper to detect occurrence of a malfunction during canopy deployment and increase paratrooper situational awareness throughout all phases of static line operations.
  - Reduce exit altitude (combat altitude of 500 feet AGL or lower)
  - Reduce system size and weight to maintain maximum number of paratroopers that can deploy from each aircraft type/configuration.
  - Support increased personnel and Combat Equipment (CE) weight up to **400 pounds (exclusive of the parachute system)**
  - Optimize paratrooper performance through improved load carriage, increased comfort and increased mobility to reduce fatigue during the entire airborne mission timeline.
  - Increase modularity across all US Army personnel parachutes including low altitude mass tactical systems and high altitude high offset ram air systems.
  - Reduce weight of harness and hardware components
  - Reduce donning/doffing and Jumpmaster Personnel Inspection timelines.
  - Increase serviceability/maintainability through replaceable components with built in service/repair indicators.

NEXT GENERATION STATIC LINE - PARACHUTE

- **Purpose:** Follow on effort in support of A-CDD and CDD development for T-12
- **Why:** Address TBD A-CDD Desired Capabilities, mature to Technology Readiness Level 6
- **Expected Effort:** Development and testing of a main canopy able to support **400 lbs all up/total rigged weight**; potential reuse of T-11R
  - Year 1: Concept Development (Whitepapers)
  - Year 2: Main Canopy Development and Experimentation
  - Year 3: Integration with T-11R

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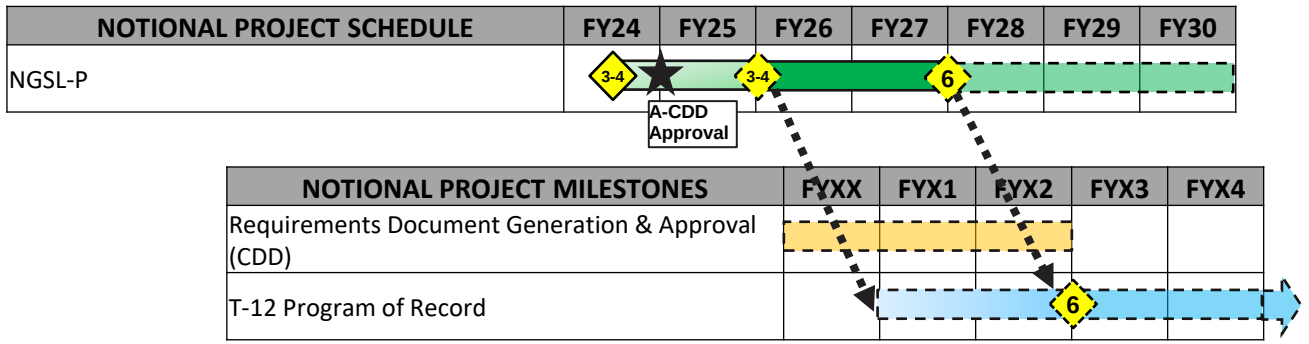

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COMBINATION AIRDROP

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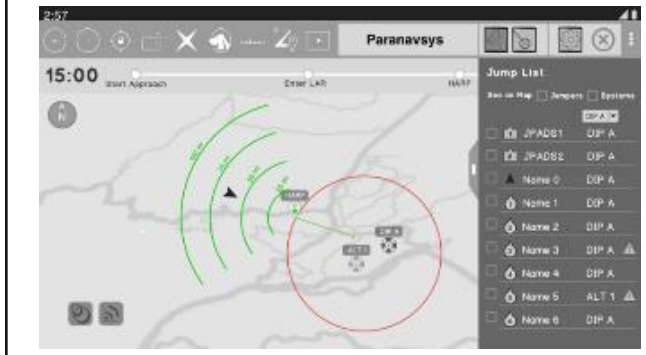
- **Purpose:** Increase safety and effectiveness of combined cargo and personnel insertions
- **Why:**
  - Mission planning uses different platforms/calculations; requires manual computation of the release point
  - No communications for programming, tracking and retargeting cargo systems
- **Description:**
  - Develop simplified, offline mission planner; available at the unit level on current user hardware/software
  - Enable communications and teaming
- **Status:**
  - Project complete and transitioned to PdM SCIE in FY22
  - May have follow-on Technical Maturation Initiative funded effort in FY25-26



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PERSONNEL INFIL/EXFIL SYSTEM (PIES)

- **Purpose:** Provide a unit organic, high offset/standoff capability for personnel infiltration, battlefield mobility and/or exfiltration in an Anti-Access Area Denial environment
- **Why:**
  - Significantly increase the range over traditional ram-air infiltrations (over 75 kms)
  - Improve probability of mission success and safety of flight with assistive technologies to augment or replace user actions to deploy, navigate and land
- **Description:**
  - Develop/employ commercial off the shelf based prototypes to demonstrate capabilities and support Tactics Techniques and Procedures development
  - Develop mission planning and navigational tools to support threat identification, mission analysis and execution
- **Status:**
  - Modeling of development vehicle to predict performance: ~ 300 kms range at 300 lbs
  - Demonstration of optional piloted controls and waypoint-based navigation
  - Operational demonstration at Army Expeditionary Warrior Experiment

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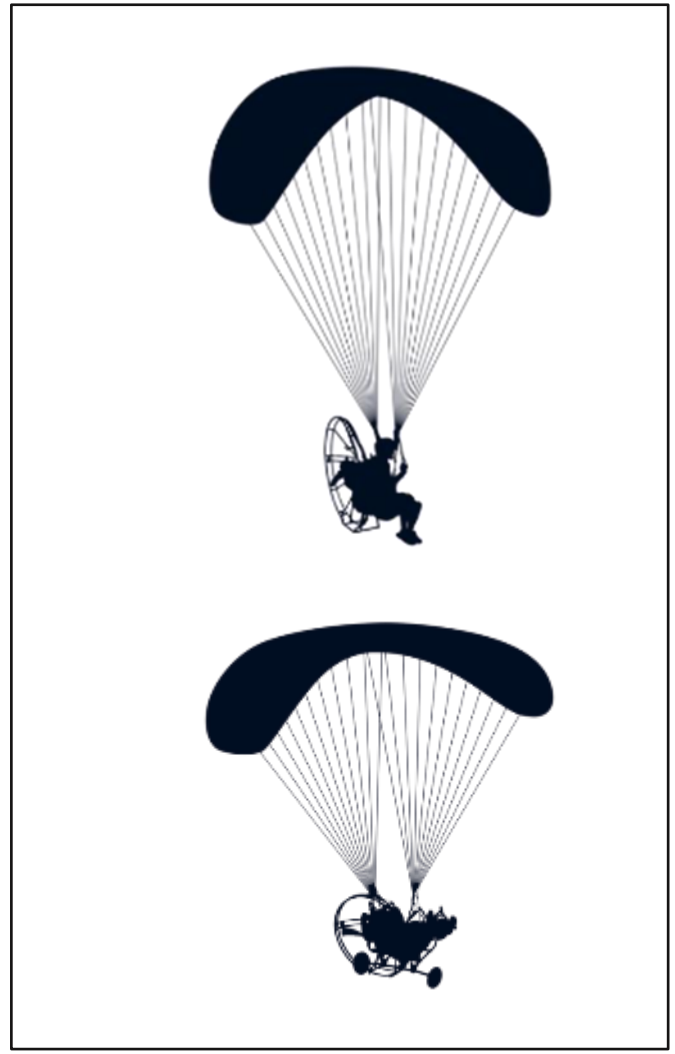

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CANOPY FLIGHT ASSISTANCE

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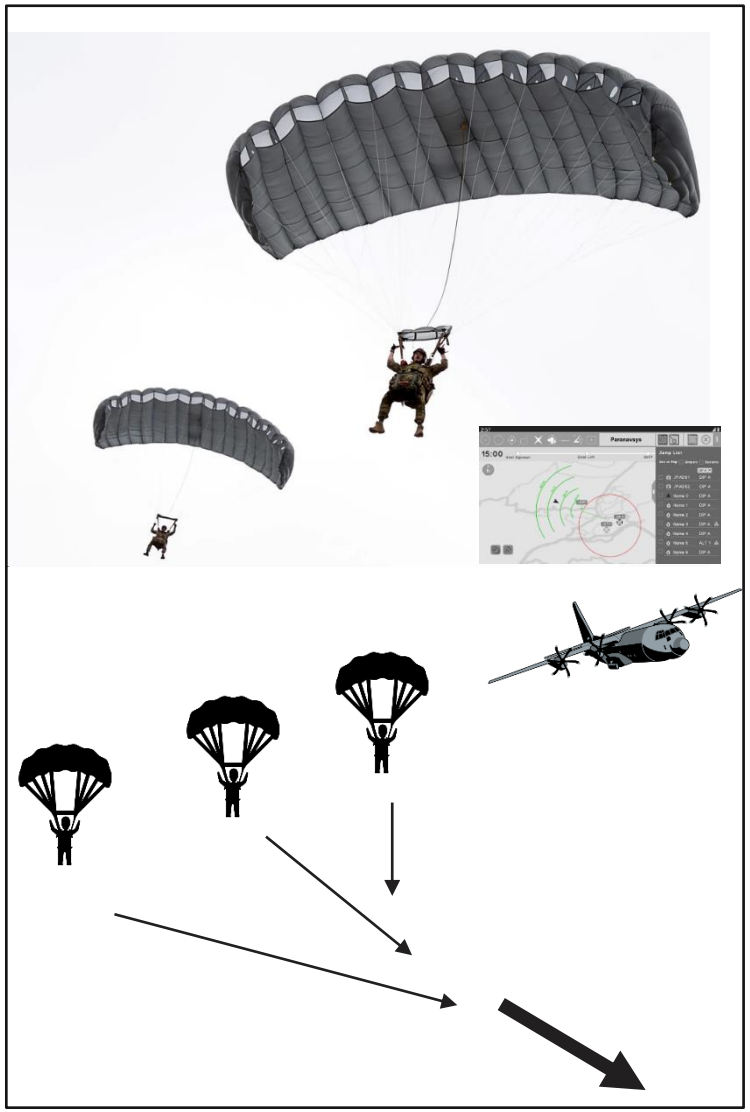
- **Purpose:** Develop technologies to assist/automate canopy flight for course navigation and stack management
- **Why:** Improve performance of small unit high altitude infiltration teams
  - Increase offset by automatically orienting all jumpers in direction of dropzone immediately after deployment and reducing user input/corrective actions during flight
  - Mitigate jumper exposure (hands above head, poor circulation, etc.) by reducing need for active canopy control starting immediately after canopy deployment
- **Description:**
  - Integrate automated control mechanisms into RA-1 main canopy for demonstration
  - Initial assessment of feasibility of concept/performance, failure modes, emergency procedures, etc.
- **Status:**
  - Planning and initial concept development FY23
  - Feasibility assessment FY24



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JUMPER TRACKER/DZSO TOOL

Summary: FY24-25 NDCEE funded DZSO tool, pending receipt of funding for project kickoff

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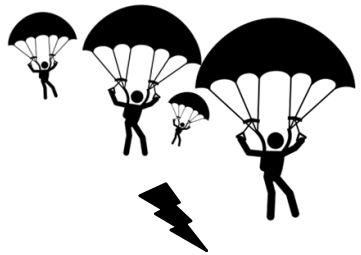
Military Freefall

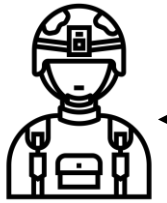
Static Line



Malfunction

Identification – Notification – Location

Radio (broadcast)
- Location
- Elevation
- Inertial



Drop Zone Safety Officer (DZSO)

Medical

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Preflight Mission Profile

- Parachute Type & Weight
- Predicted performance

Generate Actual Performance

- Rate of Fall
- Accelerations

Identify Malfunction

- Compare real time performance to predicted performance at current altitudes and jumper weight
- Identify Malfunctions
- Use current performance to predict landing location

Notification & Location

- Visual notification of Malfunction
- Predicted Landing Location (during descent)
- Display Landing Location

HIGH LEVEL INTEREST AREAS (FUTURE)

- **ADVANCED CANOPY AND HARNESS MATERIALS**
  - Lightweight and/or low bulk canopy material to reduce weight and pack volume/depth
  - Harness comfort and jumper performance, lighter weight harness/hardware components:
    - Modular design common to low altitude and high altitude parachute systems
    - Reducing open shock load requirement for harness and or equipment attachments points
    - Improved sizing/fitment, lighter weight
    - Increased serviceability/maintainability: replaceable components, rigging and JMPI visual indicators, one way connectors
- **JUMPER SA**
  - Heads-up display (HUD) and/or chest mounted, integration with full face mask/O2
    - O2/Biometric monitoring
    - Communications and proximity tracking
  - Incorporate GPS denied technologies when available at SWAP-C
  - Low observable technologies
- **HIGH PERFOMANCE PARACHUTE OPENING**
  - Develop technologies or methods for increasing reliability of higher aspect ratio canopy deployments
  - Controlling canopy opening based on jumper position (open at beneficial orientation)
  - Openings at higher and lower deployment altitudes (e.g. up to 35,000 ft for high offset, below 500 ft for mass tactical)