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## Gun-Launched Aerial Precision Munition (G-L APM)



**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**

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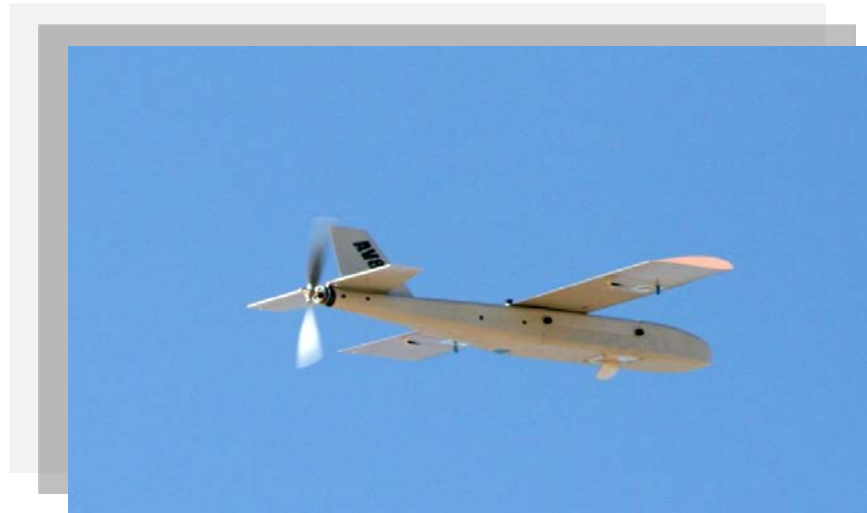
**US ARMY**

**METC, ARDEC**

**Picatinny Arsenal, NJ**



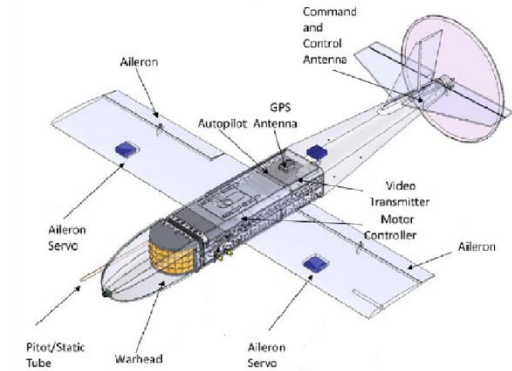
- Urban warfare targets can be effectively identified, targeted and neutralized by small Remote Armament System (RAS) capable of delivering warheads.
- This paper will cover the design such a system, how it is implemented in the Unmanned Aerial Vehicle (UAV) used as a prototype flight platform, and includes the results for its initial test flights.



- Added lethality component to non-tactical small RAS
- Elimination of RAS capture
- Technology protection through self-destruction
- Added lethality to projectile (increase lethal range)
- Deterrence to terrorism activities
- Force protection

## Unmanned Aircraft Vehicle

Length ~ 4.5'  
Wingspan ~ 4.5'  
Speed ~ 60-65 knots  
Range ~ 12mi  
System Weight ~ 10 lbs  
Warhead Weight ~ 2 lbs



Launch method ~ Air Pressure Rail Launch  
Power source ~ Lithium-Polymer rechargeable battery pack  
Avionics ~ Piccolo lite autopilot and radio, 900 MHz  
Camera ~ Color Analog Video Transmitter, 2.4 GHz





Ford  
Ranger or F150

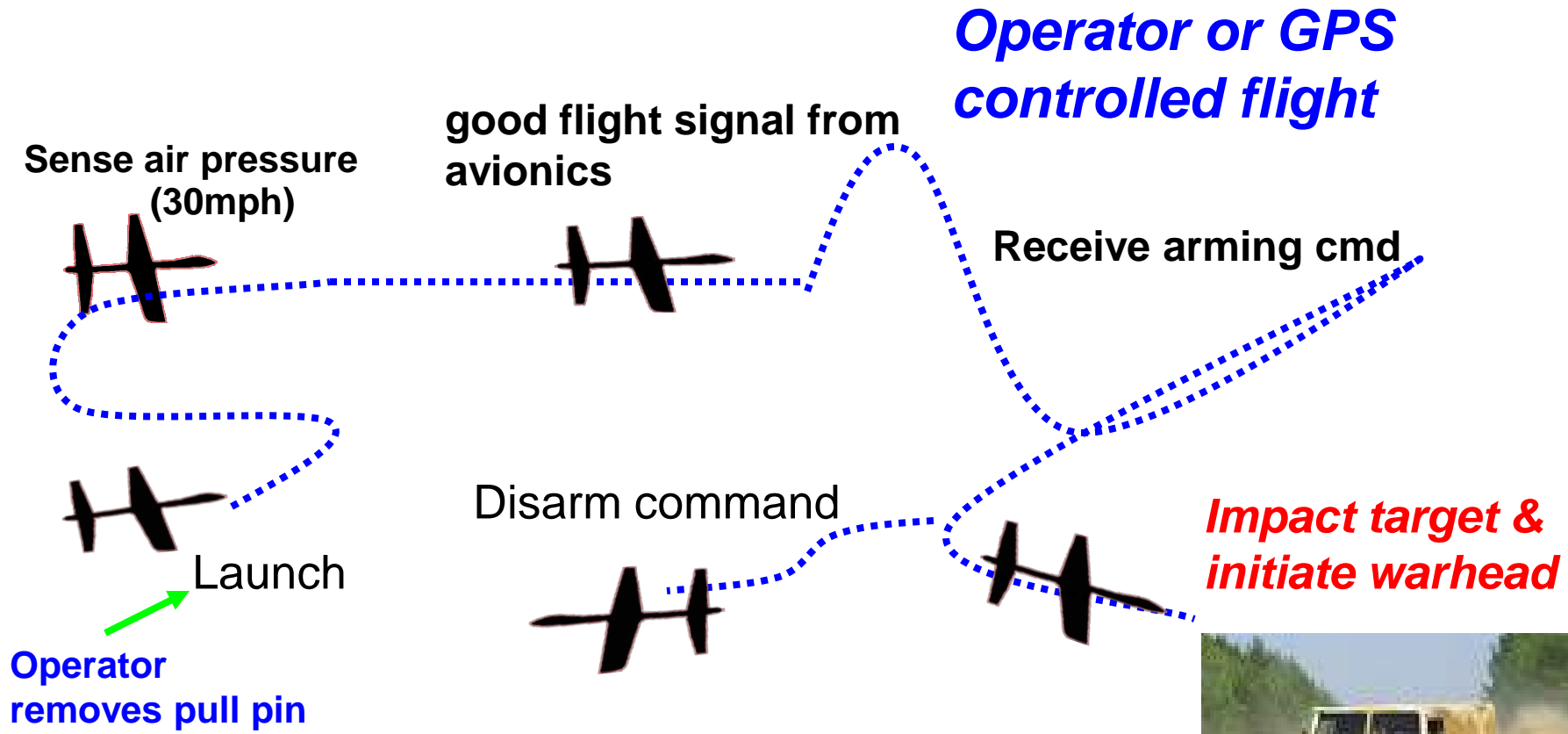


Truck A (0.5 lb C-4)	Truck B (1.0 lb C-4)	Truck C (1.0 lb Frag Whd)	Truck D (2.0 lb Frag Whd)



- Socorro, NM 3/26/2009

- Requirements:
  - Must provide safety during handling & launch
  - Meet Mil-STD-1316/MIL-STD-1901 type safety requirements
  - Function on impact with the target
  - Receive commands from the ground station to **arm**, **fire** and **disarm** in flight
  - Radio Communicates fuze status back to the ground station
- Approach: An Electronic Safe and Arm (ESA) was selected
  - Reliable
  - Compatible with the system avionics functions and communications system
  - Can be readily fire and disarmed in flight
  - Impact or Remote Self-destruction mode









- Live Fired Flight Tests were conducted on Feb-23-2010 at Dugway Proving Ground, Utah.
- Two UAV's were programmed to autonomously fly a preset pattern and home in on stationary SUV's used as demo targets with **100% success**.
  - Info transmitted from UAV validated all fuze safety features worked as designed
  - Firing pulse 1,200V through LEEFI initiation warhead on target impact.
  - Both stationary SUV targets were significant damage.
- In Summary:
  - Universal fuze functioned flawlessly, technology demonstrated.
  - Multi-purpose warhead function demonstrated with **low collateral damage**.
  - APM Flight Platform precision demonstrated.



Movie1.wmv



launch.wmv



Test 1 impact small.wmv

- ARDEC was committed to developing Gun-Launched APM technology.
- Fuzing and Novel Warhead are key parts of ARDEC's Gun Launched APM program.
- On-going effort to reduce size of fuze to fit into small APM airframe.

=> *Areas/technologies for collaborative effort?*



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