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# ***US Special Operations Command***

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## **AC-130J Airborne High Energy Laser Demonstration**

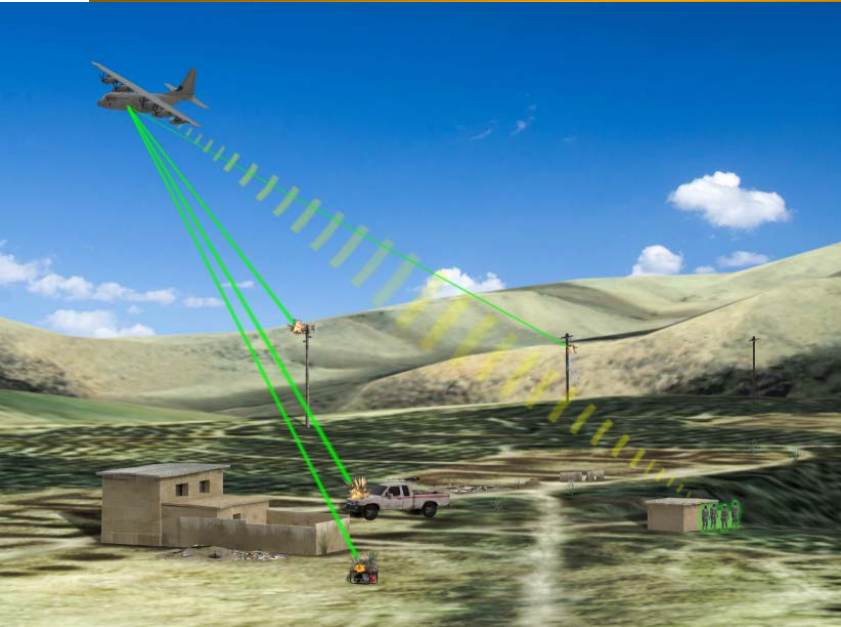
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**Lt Col Oluyomi “Yomi” Faminu  
Division Chief, Technology Insertion Division  
USSOCOM Program Executive Office-Fixed Wing**

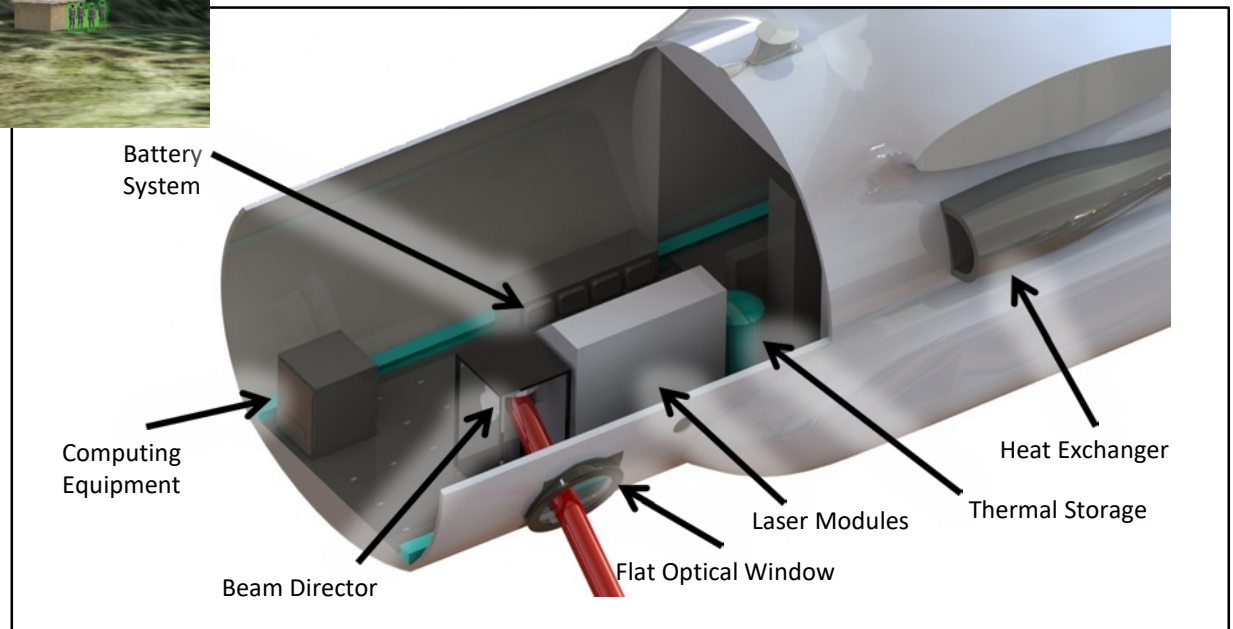
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# High Energy Laser (HEL) Concept



High Energy Laser from a AC-130J operating at operationally relevant altitude from the 30mm gun footprint

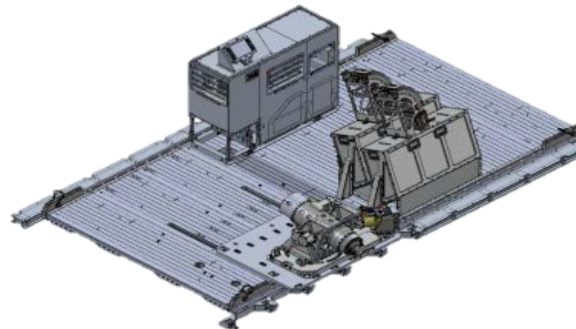




# 60 kW Prototype Trade Space

Parameter	CONOP Value		
Size	No larger than 30mm pallet		
	Threshold	Objective	
Weight	6600 lb	5000 lb	
Altitude	10,000 ft	20,000 ft	
Duty Cycle	600 sec No Recharge	180 Sec 10 %	60 Sec 25%
Fire Control	Integrate seamlessly into BMS* and PSP**		

*Total 30mm GWS Weight:  
5000 lbs - w/o ammo  
6600 lbs – full ammo load out*



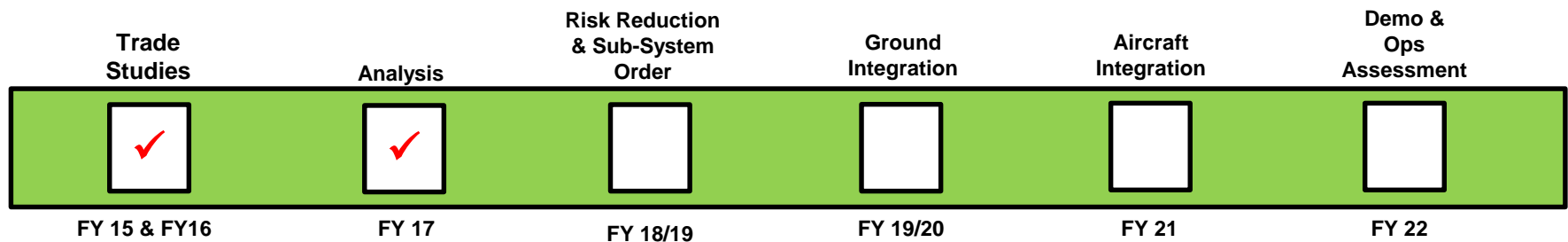
\*BMS: Battle Management Sys

\*\*PSP: Precision Strike Package



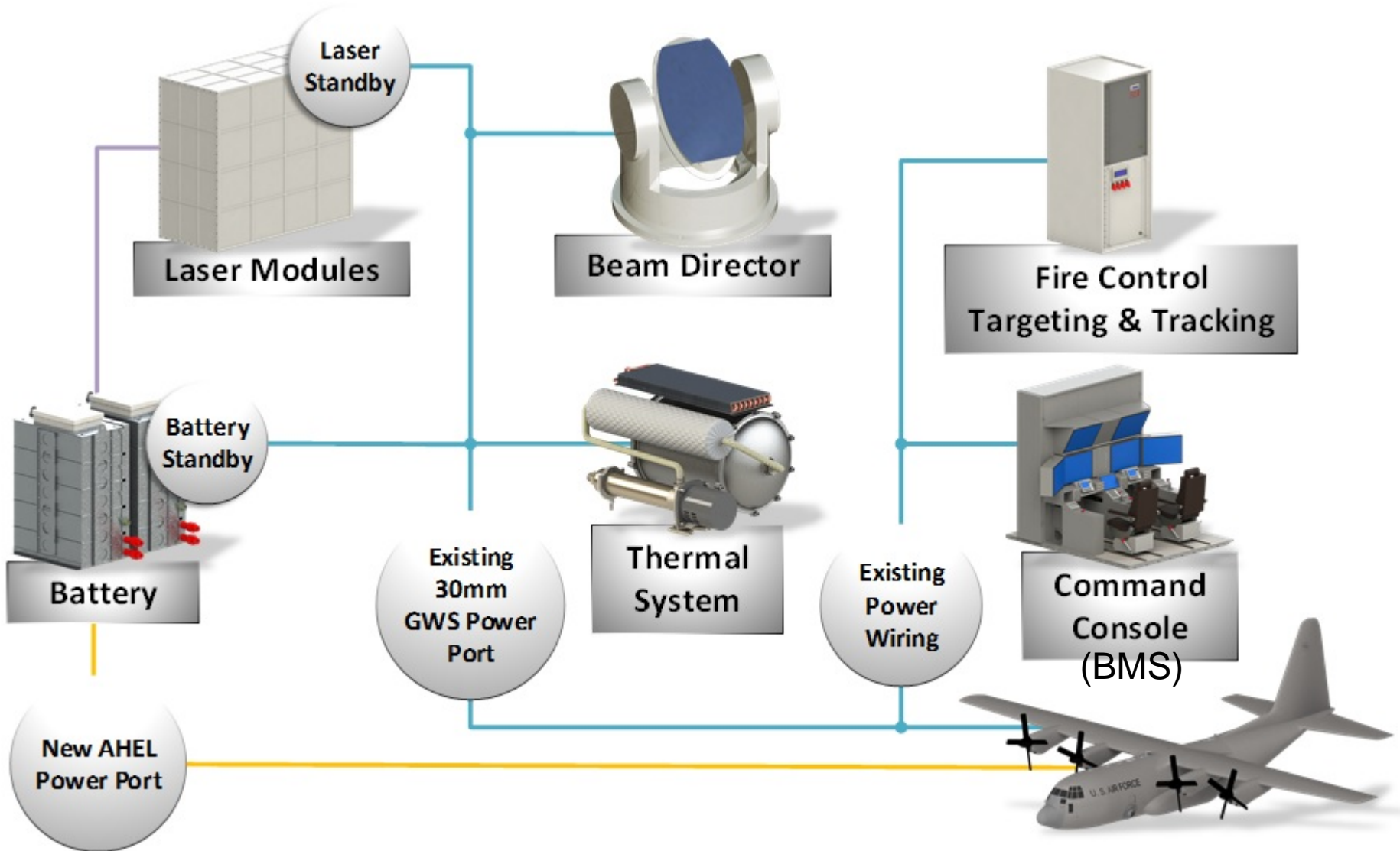
# High Energy Laser Background

- **Program Goal:** Demonstrate a precise airborne low kinetic weapon system capable of targeting in complex environments and ground based scalable effects on an AC-130J
- Completed trade studies and analysis
- Risk reduction activities initiated & Sub system order underway
- Integrate “best of breed” sub-systems with 60 kW Prototype





# 60 kW Prototype Sub-Systems





# Acquisition Approach

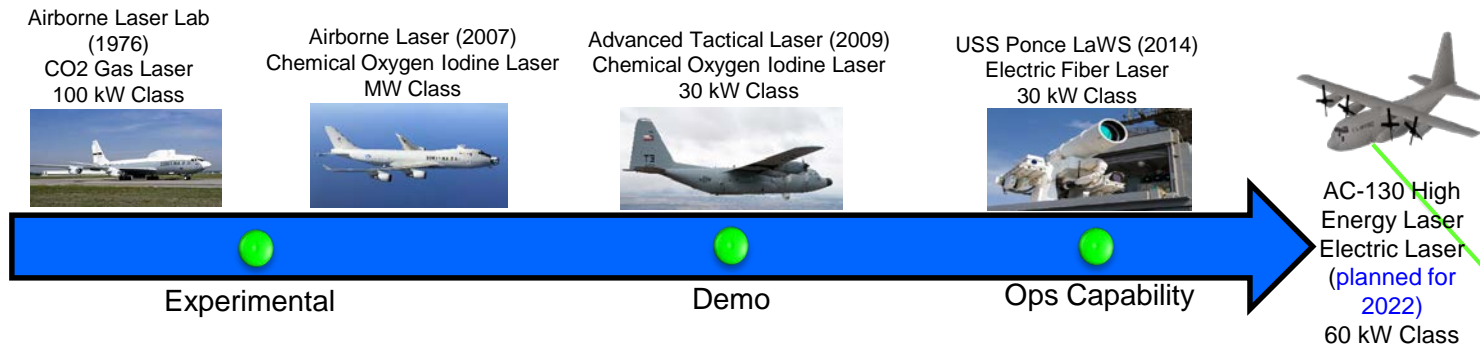
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- USG lead system integrator - Naval Surface Warfare Center Dahlgren Division
  - Provides flexibility for future system modifications/upgrades
- Leverage existing DoD Ordnance Technology Consortium proposals for “best of breed” sub-system purchases
  - Sub-systems identified & ready for agreement execution
- Develop capability leveraging use of DoD owned resources & facilities
  - Integrate with existing AC-130J fire control infrastructure
  - AFSOC provided aircraft, aircrew & maintenance
  - Utilize test hardware across DoD Directed Energy community





# Lessons Learned/Risk Mitigation

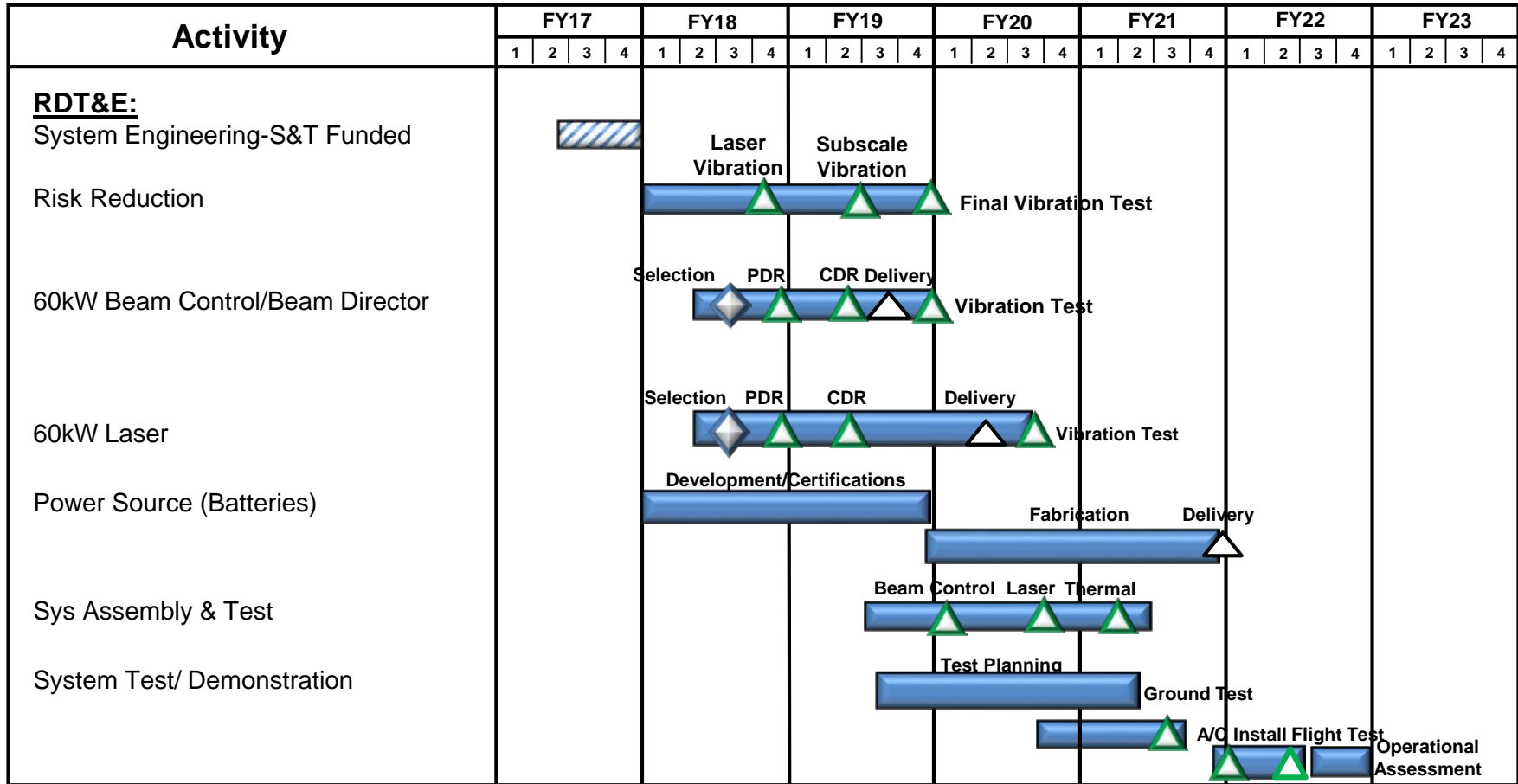


- Incorporating prior airborne laser lessons learned to inform risk reduction efforts
- Minimization of Aero-Mechanical & Aero Optical effects due to air stream (ABL, ATL)
  - Perform CFD analysis utilizing AC-130J lase scan data
  - Aero-Optic Flight characterization with surrogate window
- Minimization/management of beam jitter induced by dynamic Flt environment (ABL, ATL)
  - Compare flight vibration data to ELTF results
  - Test low power laser at post-isolation vibration & acoustic profile
- Performance of electric lasers at altitude (SWAP: Chemical (ABL) & (ATL) → Electric)
  - Vibration test of low power Spectral Beam Combined laser post-isolation



# AC-130 High Energy Laser Schedule

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As of 5 Jun 2018

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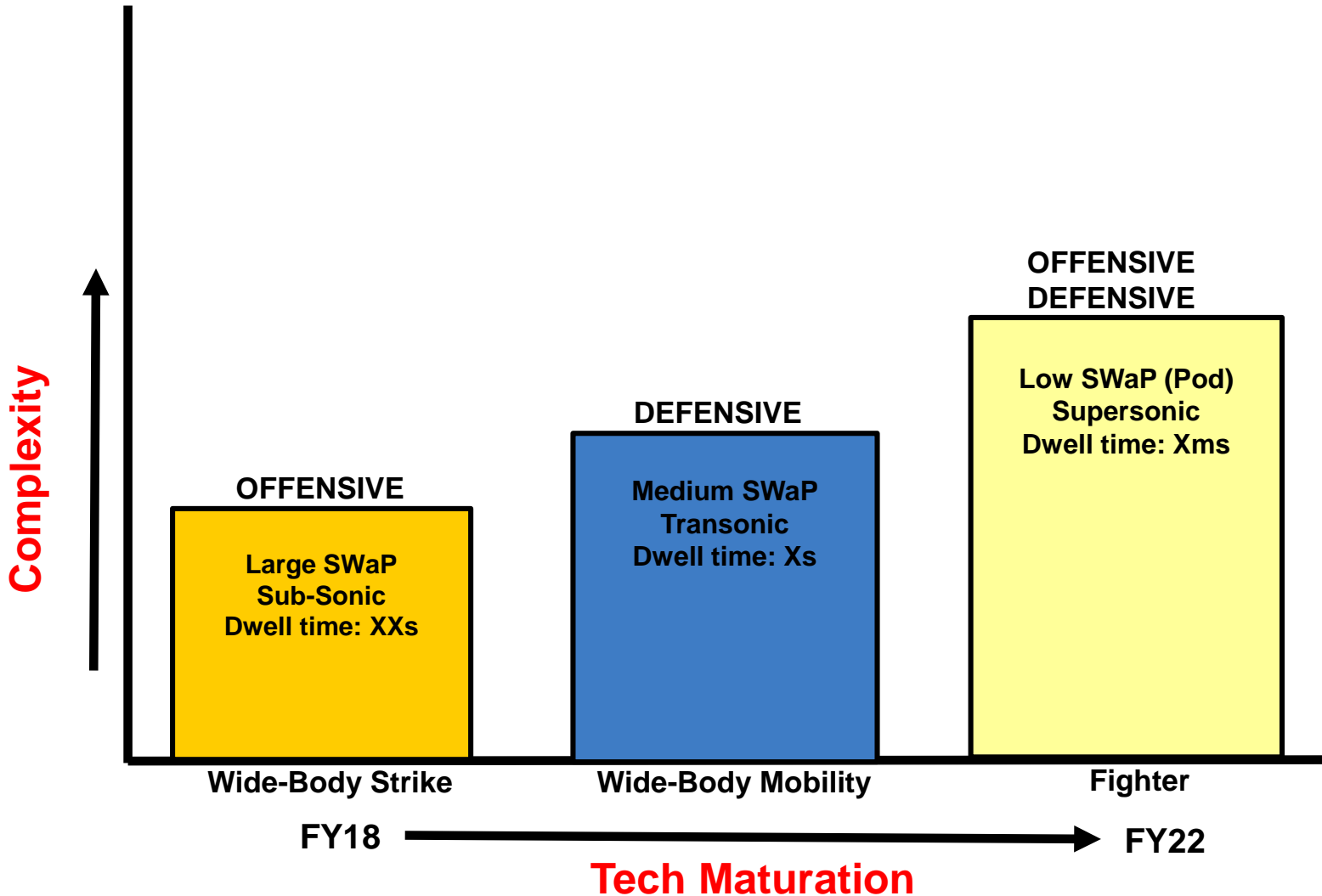
# Conclusion

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- AC-130J 60 kW High Energy Laser is a next generation weapon system capable of providing scalable effects in complex targeting environments with low acoustic & kinetic signatures
- Mitigate risks identified from prior HEL projects
- Government Lead System Integrator provides flexibility for future modifications and upgrades
- Prototype demonstration planned for FY22



# Airborne HEL Development



## INTERESTED IN ATTENDING?

Future weapons, including directed energy weapons have been in the Research & Development phase for the past several years. As the US armed forces, continue to develop and innovate in order to achieve battlefield overmatch and superiority, the Directed Energy weapon systems are making their way from the R&D phase to DoD and Military programs as the next step before acquisition and force integration.

Over the three-day summit we will examine the latest DE advancements, initiatives and plans regarding technology, acquisition and service roadmaps. This event will bring together thought leaders, acquisition executives, industry solution providers, and academia in order to tackle some of the challenges that face this community in the near, mid, and far term fight. We will look to gain insight and lessons learned from warfighter perspectives on the operational challenges and requirements of DES that will influence the capabilities of this game-changing technology.

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