# Stealthy Mobility & Support Aircraft for US Special Operations Forces

Presentation at CSIS—
Future of SOF Aviation Project

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# Conclusion Up Front

- Stealthy transports and tankers are needed to support core SOF missions in politically sensitive / high-threat environments
  - Conducting clandestine GWOT-focused SR and CT missions in politically sensitive areas (including in several countries with increasingly sophisticated IADS)
  - Conducting clandestine UW operations and supporting covert activities against hostile states
  - Clandestine CP missions (Iran, North Korea, and global interdiction of sensitive WMD materials)
  - SR/DA missions supporting conventional MCO against prospective adversaries armed with modern IADS

***Fielding a stealthy follow-on to the venerable MC-130 is a strategic priority – Failure to do so will mean that future SOF will not be able to conduct core missions where and when needed***

# Historical Context

- The requirement for stealthy mobility and support aircraft for SOF was identified by the special operations community more than a decade ago—the need is growing more urgent
- 2001 QDR:
  - "Special Operations Forces will need the ability to conduct *covert deep insertions over great distances*"
  - "Advanced air defense systems could deny access to *all but low-observable aircraft*"
- 2006 QDR:
  - The Department will "enhance capabilities to support *SOF insertion and extraction into denied areas from strategic distances*"

# The Current Fleet

- Specially modified variants of the C-130 Hercules transport
  - MC-130 E/H Combat Talon I/II transport
  - MC-130P Combat Shadow aerial refueler
  - AC-130H Spectre and AC-130U Spooky gunships
- Pros: versatile, large cargo volume and payload, low stall speed, reliable, globally serviceable
- Cons:
  - Massive radar cross section, as well as significant IR and acoustic signatures
  - Slow closure rate (200-300 knots) and very limited tactical agility
  - Getting old (Combat Talon I went into service in 1966 and the AC-130H Spectre in 1972)

# Intensification of the Air Defense Threat is Outpacing Survivability Enhancements to the Current Fleet

- Foreign militaries are using commercially available networking and data-processing technologies to link disparate air defense sensors into more effective multi-static networks
- Exploiting the exponentially increasing computational power of microprocessors and more advanced signal-processing algorithms, air defense systems are becoming more resistant to jamming and better able to handle "clutter," meaning that sensor "floors" will fall ever lower
- Prospective adversaries are also investing in more powerful radars with expanded coverage volumes *and* passive sensor systems (e.g., IR search and track, electro-optical sensors) that are difficult to localize and counter

# MC-130 Survivability is Waning—and Will Drop Precipitously Over the Next Decade

- Given current trends, the effectiveness of the TTPs that MC-130s rely upon today to penetrate into and survive within defended airspace will drop precipitously between 2015-2020
  - Pre-mission flight planning to exploit terrain-masking opportunities and "thread the needle" through ever smaller coverage gaps in multi-static air defense networks will become increasingly difficult, especially against networks comprising *mobile* air-defense radars and *passive* sensors
  - Low-level, nighttime flight will afford progressively less protection as *sensor "floors" drop* and long-range *IR sensors* are fielded in greater numbers
  - Effectiveness of jamming, ECM, and "last ditch" self-protection systems (e.g., chaff, flares, and DIRCM-like systems) will erode substantially with the *diffusion of more capable "end-game" sensors* and onboard signal-processing systems for interceptor missiles

# Views from the AFSOC Community

"After 2015, the ability of the C-130 as it's currently configured, even with enhancements, is not going to be able to go into a lot of the airspace that it needs to go into...The prediction is that the *C-130 will no longer be survivable past about 2015*."

MG John Dorris, former mobilization assistant to the commander of AFSOC, 2004

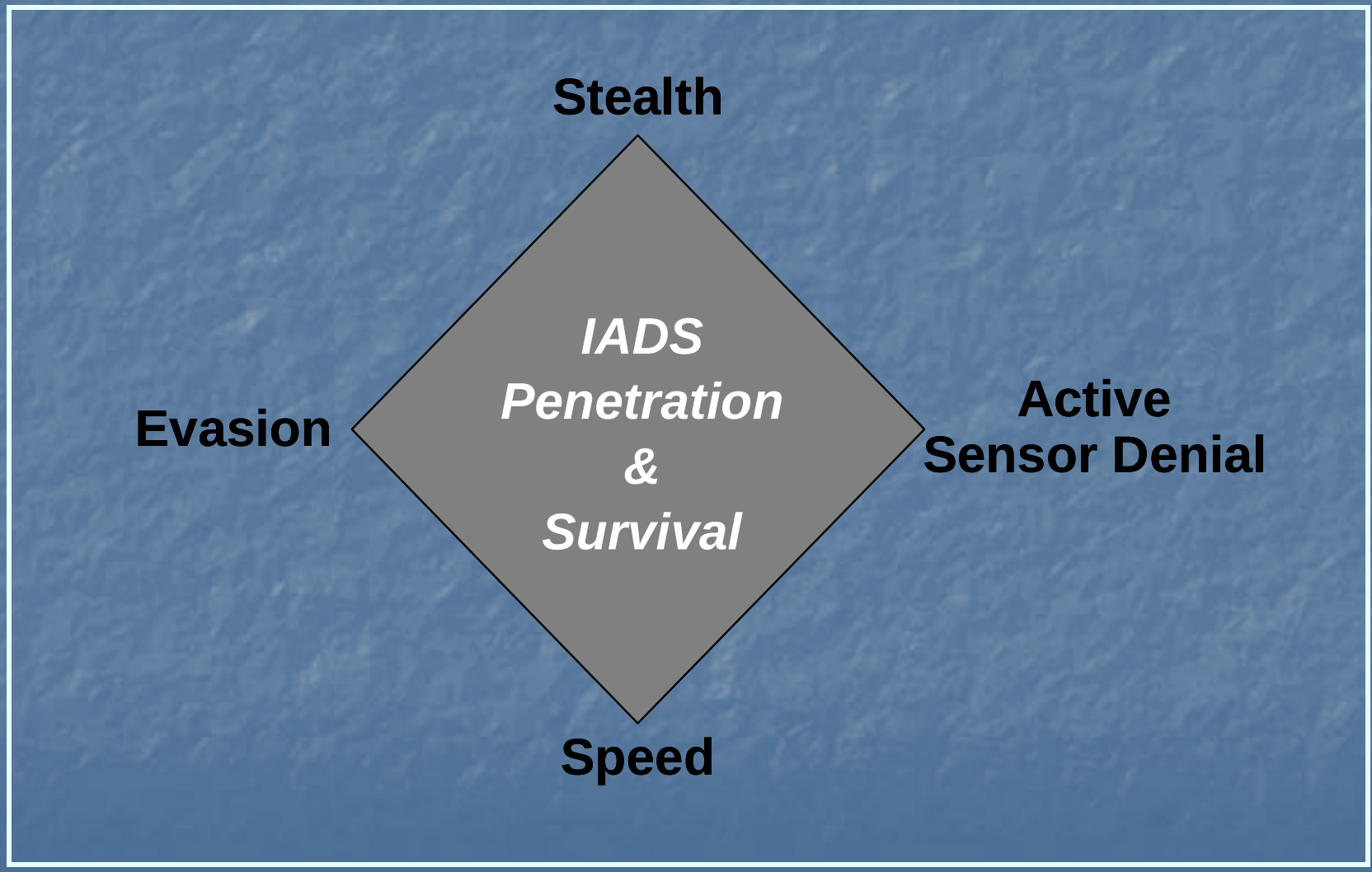
"The gunship is an amazing aircraft; however, *it cannot operate in high-threat environments—it's still a C-130!*"

Lt Gen Michael Wooley, AFSOC commander, 2005

"While AFSOC continues to modify its Combat Talon aircraft with enhancements to increase mission effectiveness and survivability, it just won't be able to make the radar detectability of such a huge aircraft with a large RCS any better. Couple that with the fact that aircraft and crew can't fly any lower or any faster; night can't become any darker; adverse weather isn't something one can conjure up when needed; there are areas in the world where AFSOC may need to go where there is no terrain to hide in; and *one quickly comes to the conclusion that AFSOC needs a new LO aircraft to remain relevant in the future*

Col William Saier, 2005

# Future Special Operations Mobility & Support Aircraft Must Exploit Stealth and Speed



# IADS Penetration: The Synergies of Stealth & Speed

- Volume of air space in which sensors can detect and track a stealthy aircraft is much smaller than with a non-stealthy one – making it easier to plan and fly routes that avoid known enemy air defenses
- A stealthy aircraft is better able to hide in clutter and exploit terrain masking opportunities
- Speed reduces the “look time” of air defense sensors and makes it makes it more difficult to maintain a targeting-quality track on the aircraft and intercept it
- If active sensor denial (decoys, spoofing/jamming) measures are required, the probability of success is much higher with a fast, stealthy aircraft

# Fielding a Stealthy Special Operations Aircraft is a Question of Will, Not Technological Feasibility

- Development of a common stealthy airframe that could be adapted for transport, tanker, and possibly gunship roles would be a “low risk” effort from a technological perspective
  - All of the required technologies are either in-hand or derivative of those in use with the B-2 Spirit, F-22 Raptor, and F-35 Joint Strike Fighter
  - Using off-the-shelf engines for propulsion, a stealthy airframe could fly in the high subsonic region (above Mach .8) or roughly 200 knots faster than the MC-130
- Although it would require a significant investment in R&D (~$10-15 billion) a stealthier, faster, higher-flying follow-on to the venerable MC-130 could be fielded in the 2020 timeframe—but only if the program is launched soon
  - Significant relevant design work already completed – Lockheed Martin B-MACK, Boeing blended-wing body concept, and other M-X AoA designs
  - Leverage R&D on LRSA aircraft with anticipated IOC in 2018? Field manned variant of LRSA for special operations applications?
  - Size of buy could be increased by buying stealthy KC-X tankers for the ACC fleet – refueling F-22, JSF, and future LRSA in contested airspace
  - Potential synergy between follow-on to MC-130 and manned replacements for the B-1 and B-52 fleet

# Desired Performance Characteristics

- Stealth—more is better, but unit cost cannot become prohibitive
- Unrefueled range: >4,500 nm
- Payload: 20,000-30,000 lb
- Speed: high subsonic
- Service ceiling: >40,000