

# On Rotorcraft and the Russo-Ukrainian War

Counterintuitively, expect strong future demand for combat helicopters—with precision standoff weapons.

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INITIAL RESEARCH NOTE  
26 MAY 2023

With this note, I am beginning an ongoing analysis of the role of rotorcraft in modern warfare, and what technologists, industrialists, and investors can do about it. To begin, I offer three points:

Loitering above a battlefield, or on an airfield, is so dangerous that most military aviation must eventually become fleeting and field-independent.

Rotary- and fixed-wing combat aircraft are somewhat fungible, as both attack and scout machines.

Industry needs battlefield demonstrations and a long-term marketing effort to encourage acceptance of a conclusive shift from fixed- to rotary-wing emphasis in battlefield air support.

I will update this analysis as events warrant.

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Last September, the Polish government announced its deal with Boeing for 96 new AH-64E Apache attack helicopters (see reporting by Bartosz Głowacki). More recently, a rather senior arms-industrialist told me that most of his current customers for military rotorcraft are talking openly about replacing their attack helicopters with drones. After all, as I recount in my working paper, [“The Air Mobility Obsession”](#) (more on that title below), large-scale military use of rotorcraft has been disastrous, for decades. Recent experience in the Russo-Ukrainian War, and specifically the ill-fated Russian landing at Hostomel Airport, should signal what Sash Tusa called last May [“The End of Air Assault.”](#) Counterintuitively, however, combat rotorcraft may very well shine after the war. Singly or in small formations, rotary-wing aircraft can still be formidable, because they are more readily hidden than fixed-wing aircraft, they are somewhat fungible with fixed-wing for ground-attack, and their polyvalence in missions has long been demonstrated. To effect that future, industry can provide some modest technological development and demonstrations, and evangelize for some organizational development in military air arms.

## Loitering above a battlefield, or on an airfield, is dangerous.

Modern warfare has become hazardous for aircraft within range of enemy weapons. As Chris Gordon reported this week, the United States government has long resisted transferring F-16 fighter jets to Ukraine perhaps not just from overblown fears of “escalation with Russia,” but perhaps also “because of concerns the aircraft would not survive Russia’s formidable air defenses.” As Jack Watling and Nick Reynolds of RUSI reported earlier this month, the longest-ranged shoot-down of the war was a Russian victory at 150 kilometers against a Ukrainian aircraft flying at less than 50 feet. The target was found with a Podlet K1 all-altitude radar, and was struck by a radar-guided missile that locked on after cresting over its apex (see reference below, pp. 20–21). However, the long-repeated argument that the F-16s were not *needed* was putting the Biden government in a logical bind. If fighter aircraft were survivable, but not capable of affecting the war, then economically-minded legislators should be asking *why so much spending on aircraft?* However, if the aircraft proved not survivable, military planners around the world would really write down their impression of much of NATO’s air forces. After all, only a few squadrons in the American and British armed forces actually fly stealthy aircraft, whatever *their* survivability. That would seriously diminish their future deterrent effect *vis-à-vis* an angry cabal of Putinists Without Putin.

More than hints of such concern had previously emerged. In its budget submission for fiscal year 2023, the US Air Force asked the Congress to buy about one-third fewer MH-60 rescue helicopters, specifically because they are not so likely to survive in combat. The requested recision was logical: if only super-cruising stealth fighters can mostly penetrate enemy air defenses, then sending “slow-ass” helicopters (an aviator-colleague’s term) after downed aircrews sounds foolish. This worked well enough when the US Marine Corps extracted Captain Scott O’Grady in 1995, the US Air Force extracted Lieutenant Colonel (later General) David Goldfein in 1999, and the US Marine Corps extracted Major Kenneth Harney in 2011. It just might not work with regularity, because the Serbs and the Libyans were not resplendently equipped with low-altitude air defenses. These days, as Air Force Secretary Frank Kendall explained last July, “there are some places where you’re just not going to take a helicopter” (see reporting by Stephen Losey).

The threat is not just to aircraft in the air, but more so, to aircraft on the ground. Ukrainian air squadrons are constantly moving their craft to prevent easy targeting by Russian cruise missiles. (The Russian Air Force’s manned bombers gave up raiding Ukrainian airfields early in the campaign.) In many wargames simulating an American-Chinese war in the Western Pacific, the US side has been shown to lose most of its combat aircraft—apart from long-range bombers flying from Missouri—in attacks on their easily located aircraft carriers and airfields (see Cancian *et al.*, 2023). Of course, Swedish JAS-39 Gripens and American A-10s operate reasonable well from unprepared fields. This is less true of stealthy fighters, whose radar-absorbing coatings require at least minor repairs after every flight. Fairly, the jump-jet F-35B was designed *ab initio* to work from hastily prepared fields, but the promise of field-independence for AV-8 Harriers never quite lived up to promise. Moreover, few ‘B’ models are available, and their combat range is rather shorter. Attack helicopters can be quite short-ranged, but tilt-rotors generally fly much farther than fighters.

## Rotary- and fixed-wing combat aircraft are somewhat fungible, and in several roles.

Note how two of those three recent rescues were effected not with dedicated combat search-and-rescue aircraft and crews, but with the units that the Marine Corps and Navy (both times from helicopter carrier *Kearsarge*) had available. The rescue in 2011 indeed made use of a long-ranged V-22 tilt-rotor.

Note also how the Israeli Air Force has shifted to a mix of fixed-wing drones and AH-64D Apache helicopters for battlefield attack, sending its more numerous manned jet fighters to do other things. For all the grief the US Air Force has received for wanting to retire its A-10C, only two other air arms worldwide maintain large numbers of dedicated, fixed-wing, ground-attack aircraft: the Ukrainian and Russian Air Forces. Whether fixed- or rotary-wing, both sides rarely fly at high altitude near the front, because both sides have lots of portable missiles and radar-laid guns. To compensate for that vulnerability, both sides are using their Mil-24 helicopters and Sukhoi-25 jets like flying artillery, largely lofting unguided rockets in standoff area attacks.

Today, then, the fixed-and rotary-wing aircraft are often serving the same roles, in much the same way, and possibly without too much inter-service angst. Former USAF Chief of Staff General Mark Welsh, as a mere lieutenant colonel back in 1993, wrote his master's thesis on "the absolute nightmare... of inter-service rivalry and friction" in providing close air support (CAS). Welsh's view back then was striking:

*The AH-64 Apache provides the only true large-scale, night, adverse weather CAS capability... every honest CAS pilot, fixed- or rotary-winged, Army or Air Force, will admit that an attack helicopter can identify, target, and destroy armored vehicles with much greater efficiency than any fighter seen to date (pp. 7-8).*

Note how the Ukrainians have consistently been asking for both fixed- and rotary-wing combat aircraft. While the Czechs gave the Ukrainians their Mi-24 attack helicopters (see the report by Drew Hinshaw), the next-door Slovaks sent them 13 MiG-29 fighter jets. To facilitate that transfer, the US government is selling 12 AH-1Z attack helicopters to Slovakia, along with 500 Hellfire II missiles, at a deep discount, and specifically as "indirect compensation" for sending the jets. (See reporting by Dominic Perry in *Flight Global*, and by the editorial team at *Defence Today*.) Replacing fighter jets with attack helicopters suggests some fungibility between rotary- and fixed-wing combat aviation, and in both attack and battlefield reconnaissance. The US Marine Corps uses much smaller AH-1Z Viper helicopters (the latest version of the AH-1 Cobra, that dates back to the Vietnam War) as an attack-scout. As a former marine aviator told me about ten years ago:

*The genius of the AH-1W, and now Z, is that it was ready to pick up the scout mission as soon as it needed to do so. We were trained from the time we were young puppies to demand the grunts let us do "detached escort" to roam the plains on our own without*

*being tied to anyone or anything... despite its name, the AH-1 is a multi-mission aircraft by design. Superb optics, superb weapons delivery systems... and two winged pilots running same. Those pilots had to understand the systems on the plane as well as the scheme of maneuver on the ground... Not uncommon for guy in back to basically hover the plane, or even land, for over an hour while the guy in front (who had superb front row-balcony seat) ran the battlefield. Planes must be able to do more than one thing. And so must the pilots.*

Both the Royal Netherlands Air Force and the British Army Air Corps fly their AH-64s as both attack and scout machines. The French *Aviation Légère de l'Armée de Terre* (ALAT) flies the Eurocopter EC665 Tiger in both roles. The Australian Army actually called its Tigers 'ARHs'—*Armed Reconnaissance Helicopters*. In the modern context, all these machines have two problems: they lack sufficient range for relevance in the Western Pacific, and they lack standoff precision weapons for survivable lethality above the modern battlefield.

## **Industry needs battlefield demonstrations and a long-term marketing effort.**

Consider the Ukrainian Mi-24 gunships, which are actually multi-mission aircraft, with both forward-firing rockets and seating for eight troops. That indirect rocket fire that is more accurate than one might guess, but rotary-wing craft generally lack standoff precision weapons. Tilt-rotors with precision standoff missiles could fly far and fast to respond to calls for fire along a long front, plugging gaps where artillery could not. With standoff precision weapons, helicopters may be better than fighters for battlefield air support, as their basing does not require runways. In the future, all military aviation within range of enemy precision weapons may need to be truck-portable, or at least field-independent. Cruise missiles and drones will always outrange manned fighter jets, because they need not haul aircrew, human accommodations, protective systems, and large payloads. They only need to fly one way with a small warhead to kill that fighter jet.

Investors, industrialists, and technologists who want to get ahead of this problem can undertake two tasks.

### **First, demonstrate both the technology and the operational art on and over the battlefield.**

Bell has made limited progress in marketing the V-22 and the V-280 to its various customers as multi-mission machines. While the all-aspect visibility from the cockpit is not that of the AH-1Z or the AH-64E, similarly robust optics and weapons could be made available for forward-firing roles. In the short run, marketers should expect that some dedicated attack helicopters will remain in force structures. In the long run, transport helicopters and tilt-rotors may be alluring longer-range craft for stand-off attack. This suggests that Bell, with the best technology globally in long-range rotorcraft, might organize a demonstration of precision weapons launched from a V-22 and V-280. Adapting such a craft with forward-firing missiles seems not radically more difficult than turning a C-130 transport into an AC-130 gunship.

Alternatively, a firm other than an aircraft manufacturer, but with a strong position in aircraft weapons integration, might offer such an integration demonstration to the Army or Marine Corps. Of course, anywhere else worldwide, plenty of transport helicopters could be available for such demonstrations and conversions.

## **Second, in the long-term, undertake marketing to change service culture.**

In the US, such a shift from fixed-wing to rotary-wing aircraft for close air support probably means a shift towards intra-service air support, and away from enthusiasm for large-scale air assault. Army and Marine Corps rotorcraft would handle battlefield roles, while Air Force and Navy jets would do those other things. This might not require a complete rethinking of organizational ethos and culture by military air arms, as Army and Marine aviators can think about hide sites almost as well as Swedish and Ukrainian flyers. Even so, they would benefit from some public, intellectual top-cover for the idea, and over time. This means a multi-year campaign of encouraging writing on the question of aircraft vulnerability, basing, and flexibility in multiple roles. As Byron Callan of Capital Alpha Partners wrote on this issue last year,

*There's an analogy to airborne operations in the 1940s-50s to consider. Germany used successfully used small paratroop/glider operations in 1940 campaigns, but the very high costs of an operation to seize Crete in 1941 convinced Germany to avoid large-scale use of this form of air assault. Allied forces, however, did not draw the same conclusion as Germany did in 1941 or even from the use of an allied air assault in Sicily in 1943. The Allies conducted major paratroop and glider operations as part of the opening move in Normandy in 1944. A failed campaign to capture Arnhem in 1944 using British and Polish airborne forces could have also signaled the demise of these forces, but paratroop and glider forces were used again during Rhine River crossings in 1945.*

Marc DeVore entitled his monograph on the persistence of parachuting fiascos “When Failure Thrives,” and his earlier, shorter essay “The Airborne Illusion”. Paratroopers are an even more questionable idea today, but the United States Army maintains five brigades of them. Outside Russia, almost no other army has such a devotion to paratroopers, but the intra-service political power of the paratroopers has long guaranteed them a force structure far in excess of their potential. In contrast, Welsh opened his master’s thesis with competing quotes from Air Force generals about how much the Air Force did or did not care about close air support. Shifting that mission to rotorcraft would be in keeping with a global pattern, and ultimately quite doable. The returns for companies like Bell could be considerable.

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