Untethered Operations

Rapid Mobility and Forward Basing Are Keys to Airpower's Success in the Antiaccess/Area-Denial Environment

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An operation incorporating "untethered" sortie generation can unleash the asymmetric advantage of US, allied, and coalition airpower. The unmatched flexibility and capacity of alliance and coalition C2, mobility, and logistic strengths can bring together the right aircraft, weapons, fuel, maintenance, and Airmen at the right place and time to create the combat power needed to win.

—Gen Frank Gorenc
Commander, USAFE-AFAFRICA

A lone C-17 landed smoothly in the predawn hours at Ämari Air Base, Estonia. The C-17 was from the Heavy Airlift Wing in Pápa, Hungary. Ämari had yet to experience the devastation of a Russian air attack. The sheer number of NATO basing options made targeting all of them impossible and had so far kept Ämari safe.

The cargo ramp was already lowering as the C-17 taxied to a stop and USAF Airmen piled out. The seemingly deserted base came alive as Airmen began organizing the ramp. There were aircraft maintainers, operations and intelligence personnel, and a squad of security forces. They went to work immediately, unlocking and organizing munitions, connecting fuel lines to hydrants, and setting up expeditionary defensive fighting positions. The operations and intelligence personnel set up a deployed ops center.

In less than an hour, four Dutch F-16s entered the traffic pattern and landed quickly. Like the C-17, the fighters had barely come to a stop before Airmen clambered over them, helping the pilots unstrap and egress. The aircrews were hustled to the waiting intelligence officers while the aircraft were reloaded with bombs and fuel. The operations update and intel briefings would last just as long as it took the Airmen to rearm and refuel the jets. They would then depart on their next combat mission—their third of the night.

In less than two hours, the F-16s were gone, and the C-17 was taxiing for takeoff. The next base was Łask in Poland where a flight of US F-16s was scheduled to join them. The C-17 could do this three more times before it had to return to Ramstein and refit. NATO forces were repeating this scene all over Eastern Europe. The war is going well; Russia simply doesn't have the capacity to fight across such a broad front.

This scenario is fictional, but it depicts the high end of a new concept called untethered operations (UTO), which leverages robust basing and North Atlantic Treaty Organization (NATO)/partner interoperability to complicate Russian targeting and create an arsenal of options for allied combat operations in Europe. The Russian annexation of Crimea in 2014 and continued aggression toward Ukraine provide both insight into Russia's intentions and a grim reminder of its lethal potential to accomplish its goals. As Russia reasserts itself in Eastern Europe and NATO gears up to respond rapidly, UTOs offer a glimpse of the future for allied air forces in the European antiaccess/area-denial (A2/AD) environment.

Antiaccess / Area Denial

Simply put, "*anti-access* (A2) challenges prevent or degrade the ability to enter an operational area. . . . *Area denial* (AD) refers to threats to forces within the operational area" (italics in original).[1] Although opposing forces throughout history have tried to deny each other freedom of movement around the battlefield, during recent conflicts in Iraq and Afghanistan, these actions occurred mostly at the tactical level. However, "just as Blitzkrieg changed combat in 1940, anti-access/area denial technologies and strategies have re-defined the character of modern warfare."[2] In this new environment, sophisticated adversaries will use asymmetric capabilities—including electronic and cyber warfare, ballistic and cruise missiles, advanced air defenses, mining, and other methods—to complicate our operational calculus.[3] US strategic guidance has been clear in noting that despite the challenges of operating in the

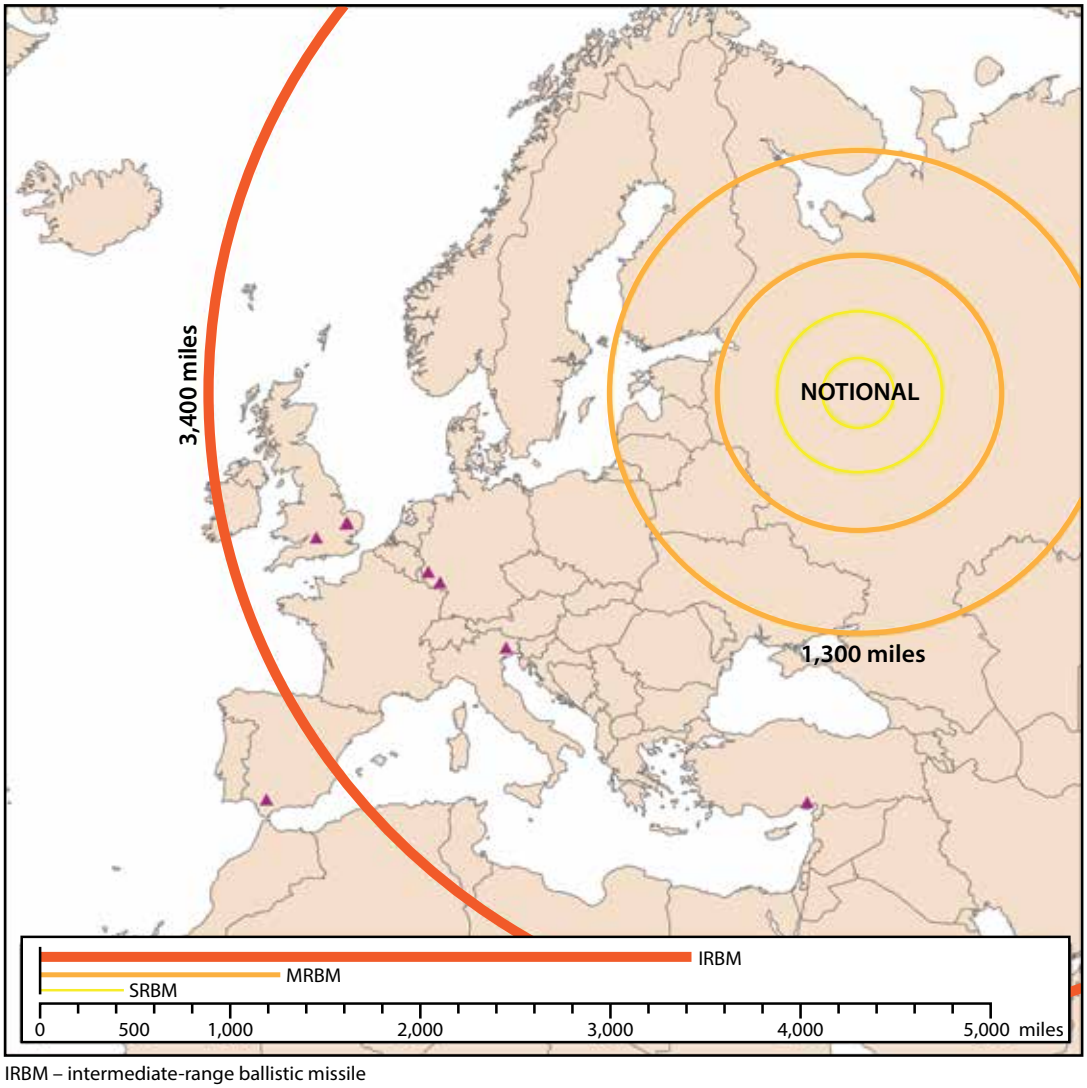
A2/AD environment, US forces must continue to project power to credibly deter potential adversaries and prevent them from attaining their objectives.[4]

Recent discussions of A2/AD have mostly focused on the Western Pacific theater of operations; however, Russia's aggression in Ukraine makes it clear that European security and the international rules and norms against territorial aggression cannot be taken for granted.[5] Given this backdrop, Russian A2/AD capabilities pose new issues for US and NATO/partner air forces.

Russian Threat

Russia's latest doctrinal revision lists NATO as its top national security threat. Russia's defense budget already accounts for 20 percent of all public spending, and it plans to spend an additional 20 trillion rubles (364 billion US dollars) on defense over the next five years. Eighty percent of those funds are targeted toward high-tech nuclear, space, reconnaissance, and communications weapons.[6] Adding quality to quantity, Russia's State Armament Plan calls for modernizing 70 percent of the armed forces by 2020, including upgrades to procurement and development, expansion of surface-to-air missiles and ballistic missiles, and at least 150 new airplanes and helicopters.[7] Advanced standoff weapons like Russia's pose major threats to US and allied air force operations, especially as that country increases the sophistication of its integrated air defense and invests in ballistic missile systems. Intermediate-range missiles that can travel between 300 and 3,400 miles could allow Russia to reach many NATO countries (see figure on the next page).[8]

Russian ballistic and cruise missiles with ranges far greater than 1,000 miles and accuracy measured in tens of meters reduce the options available for allied air forces, including (1) operating from greater distances, (2) dispersing operations to a larger number of bases, or (3) to the extent possible, increasing the defenses of all bases.[9] Most US main operating bases (MOB) are within 1,500 miles of Russia—too close to count on distance as a defense. Similarly, hardening these bases to withstand a determined attack by advanced weaponry has historically proven costly in terms of construction and maintenance, leaving the option of dispersing operations and decreasing dependency on MOBs.[10] European geography and the numerous NATO / partner nations offer unique opportunities to disperse operations by building on traditional forward arming and refueling point (FARP) concepts.



IRBM – intermediate-range ballistic missile
MRBM – medium-range ballistic missile
SRBM – short-range ballistic missile

Figure. US Air Forces in Europe main operating bases within footprint of notional intermediate-range ballistic missiles

Forward Arming and Refueling Point

The Department of Defense defines FARP as "a temporary facility, organized, equipped, and deployed to provide fuel and ammunition necessary for the employment of aviation maneuver units in combat."[11] According to Maj S. E. Mills, USMC,

> The advantages of forward aircraft basing have been recognized for almost as long as military aviation has existed. Hans Rudel, the most feared German Stuka pilot of WWII, relied on forward bases that had been cached with fuel and ammunition which allowed him to maneuver his aircraft wing along the entire Eastern Front. . . . The ability to resupply his aircraft virtually anywhere along the front gave Rudel the logistical support required for him to extend aviation's influence over a vast area. He was able to plug holes created by penetrating Russian armor forces located long distances away from his organic support base. Rudel could also strike deep to interdict reinforcing enemy units. The Germans had learned early that when logistically sustained near the target area, aviation was, more often than not, the decisive element in the outcome of a battle.[12]

FARP in the Air Force emerged from lessons learned in 1980 during Operation Eagle Claw, the attempt to rescue hostages held in Iran. During the operation, Air Forces planners realized they needed an efficient way to transfer fuel from aircraft to aircraft—helicopters in this case—in a hostile environment. The resulting use of FARP operations expanded the role of special operations forces around the world by providing a means to "hot" refuel (i.e., while the engine is running) from tanker aircraft to various types of fixed- and rotary-wing platforms.[13] Since then, US and NATO air forces have implemented elements of FARP through NATO cross-serving exercises designed to support the regeneration of combat aircraft should they divert to a NATO air base other than their home station.[14] The idea of conducting FARP operations to support fighter aircraft (fighter FARP) was revived in Pacific Air Forces' (PACAF) recently developed Rapid Raptor concept of operations.[15]

Rapid Raptor—Fighter FARP in Pacific Air Forces

Designed to operate aircraft in an A2/AD environment, Rapid Raptor uses the innovative concept known as fighter FARP, which combines sortie-generation capabilities and mobility support to enable more expeditionary and dispersed operations. It makes use of existing airfields throughout an area of responsibility to increase the range and tempo of fighter operations.[16] Conceived in 2008 by two pilots who were trying to figure out how to use a C-17 to deploy F-22s to any base that needed them, Rapid Raptor seeks to operate fighter aircraft in PACAF's contested environment and project combat power against China.[17] The concept calls for deploying fighters and employing a single C-17 to move all of the support required to refuel, rearm, and maintain the aircraft in an austere environment.[18] PACAF exercises Rapid Raptor annually, deploying from Joint Base Elmendorf–Richardson, Alaska, the most recent exercise having taken place at Andersen AFB, Guam. Although Rapid Raptor's goal was to load everything into a single C-17, the deploying unit had to borrow selected aircraft-generation equipment and material-handling equipment from the exercise location.[19] However, everything F-22 specific was transported via the single C-17 to the deployed location, including 36 support personnel for maintenance, munitions, weapons, and fuel.[20] Rapid Raptor demonstrated the potential value of fighter FARP and limited logistics support in the Western Pacific theater of operations.

Untethered Operations

The UTO operational concept depends upon light logistics and forward basing to offer increased agility to fighter operations in the A2/AD environment. It seeks to reduce or even eliminate the need to "tether" fighter aircraft to MOBs. In Europe, UTOs combine the benefits of the geographical distribution of European air bases, traditional FARP, and the fighter FARP exercised during PACAF's Rapid Raptor.[21]

Like Rapid Raptor, UTOs begin with the baseline requirement to fit all fighter-support needs into a single C-17; however, unlike Rapid Raptor, UTOs are not weapons-system specific. The basic package is designed to support four fighter aircraft in the most austere environment. The single C-17 template forces load planners to prioritize support demands to keep the logistics tail as lean as possible, thus increasing agility, reducing coordination requirements, but placing limits on the number and types of missions supported.

Producing fighter sorties from an austere location is largely a matter of logistics. Whether operating from a MOB or a forward operating location (FOL), fighters must have a runway, fuel, munitions, support equipment, spare parts, and the personnel to operate them. The logistics equation is basic: the more munitions and support equipment that can be stored at the forward location, the less the need to transport that materiel and the more flexible the options become. If enough support is pre-positioned, then the logistics load can be reduced to the point that a single C-17 (or even a C-130) load can support fighter operations almost indefinitely. Adding forward fuel storage to the capabilities virtually eliminates the need to refuel from transport aircraft; support aircraft could then hop from base to base, helping with multiple fighter packages each day. Selected FOLs could also be used as logistics "mini-hubs," and transport aircraft could remain overnight, refitting without returning to a MOB. Fighters could even recover at a mini-hub to make minor repairs or conduct periodic inspections. As FOLs mature, bases could be categorized by the level of support available. For example, at a level-one base, having nothing more than a suitable runway, aircraft would have to deliver all logistics, thereby significantly limiting the number and types of combat sorties available. A level-five base, however, might have munitions, fuel, and all material-handling equipment pre-positioned, resembling the base described in the fictitious scenario at the beginning of this article. It would take a fully loaded C-17 to support limited combat operations at a level-one base, but a minimally loaded C-17 could hop from one level-five base to another, supporting multiple combat sorties. Such a prospect is no longer purely theoretical but is rapidly becoming reality.

Forward basing is essential to the UTO concept. UTOs in Europe capitalize on US and NATO / partner nations to increase basing options dramatically and reduce logistics demands. Detailed site surveys already have been conducted at about 100 NATO/partner bases in US Air Forces in Europe (USAFE), and more than 400 bases in Europe are capable of supporting fighter operations.[22] A number of these bases are routinely used by allied forces, and many more are becoming available. By identifying minimal mission requirements for flight operations and selectively improving facilities throughout the theater, USAFE and NATO installation planners are rapidly increasing basing options. Some of the improvements to NATO/partner air-

fields include runways, munitions storage, fuel storage, and warehousing. Each of these enhancements directly supports flight operations and/or frees valuable pallet positions on transport aircraft, thus adding to the options for mission planners.

Developing NATO bases is a strategic plan with some tactical opportunities. Strategically, planners take advantage of US and NATO funding to devise long-term improvements. The NATO Security Investment Program offers approximately 800 million euros annually to the 28 member nations to spend on essential facilities and certain equipment within specific capability packages. Projects funded through that program are usually planned and executed in 5 to 20 years. The tactical aspect is offered by funding recently approved under the European Reassurance Initiative, which has enabled USAFE planners to accelerate the development of bases throughout the theater and has helped mature UTO capabilities.

USAFE logisticians also utilize the UTO factor of European geography to decrease airlift requirements. Unlike the Western Pacific theater of operations, Europe is a small area of responsibility well connected by a seasoned network of roads. Even the most austere bases have roads capable of supporting ground-resupply convoys, thus presenting mission planners with even more options. In a bare-base scenario as described in the level-one example, a single C-17 might carry the support load needed to launch initial combat sorties. Regardless of munitions expended or fuel consumed, it would still have to return to a MOB to refit after a relatively short time. Because most allied bases in Europe are only two to three days' ground travel apart, the option of resupply by convoy essentially eliminates the need to return to a MOB. In this scenario, fighter aircraft could continue to fly for weeks or even months before returning to a MOB. As UTOs in the theater develop, an unlimited number of possible basing scenarios will emerge.

The interoperability within NATO / partner nations offers yet another unique opportunity to further expand UTOs and reduce the logistics tail for allied planners. US and NATO / partner nations have long-standing relationships among their air forces and have historically leveraged each other's support. As mentioned above, NATO cross-servicing exercises designed to enable mutual support to fighter aircraft among allied nations were conducted in the Cold War and as recently as 2010.[23] Such exercises not only resemble a basic FARP operation but also offer an example of how interoperability can enhance capability. The next step is to identify the specific skill sets that enable NATO / partner nation forces to support combat-sortie generation and deliberately create training events through programs in building partnership capacity (BPC).

BPC training is not limited to skills directly tied to flight operations; rather, it includes other necessary support functions such as crash-fire rescue, security forces, and aerial port operations. Improved interoperability across the spectrum of flight operations and agile combat support functions both reduces the logistics problem for allied planners and enables countries with few or even no modern fighters to participate in defense efforts. This participation goes a long way toward solidifying relationships and gaining key participation in allied operations. With robust BPC efforts, one can easily foresee a time in the not-too-distant future when US aircraft could be fully serviced and launched by allied forces without US support.

Operations

Robust basing options and interoperability with NATO / partner nations create numerous operational ways of employing airpower in Europe. Airfield and pre-positioning improvements already in the works by USAFE and NATO planners are force multipliers in an A2/AD environment. As the threat evolves to deny access, the combined force air component commander (CFACC) can rapidly adjust to the environment, matching regeneration capabilities (pre-positioned, airlifted, or ground transported) at various locations with combat aircraft requiring refueling and rearming.

Reviving a NATO cross-servicing mind-set and BPC regime that maximizes the capabilities of our NATO allies / partner nations will facilitate execution of a scenario similar to the one described at the beginning of this article. Conceptually, during UTO execution the CFACC would maintain a living playbook of air base capabilities and capacity to expedite near-real-time decisions that shift regeneration capabilities and subsequently direct combat aircraft to the appropriate air base for refueling and rearming. Similar to targeting methodology during the development and execution of an air tasking order, UTOs could be deliberately planned and included in that order, directing the airlift of required regeneration capabilities and projected FARP timing at specific air bases. The deliberate planning capacity and tempo would take into account the air base categorization construct—level one (austere) to level five (robust). The higher the level, the greater the capacity and/or increased tempo the CFACC can expect in planning and execution. Should the threat environment change and/or regeneration capability fall below the minimums required, UTO regeneration capabilities and execution could be dynamically retasked to a more suitable air base.

Opportunities

UTOs are not constrained to an A2/AD environment. They can be applied across a spectrum of environments and scenarios both in and out of the European theater. Following the Wales Summit in September 2014, NATO began establishing a Very High Readiness Joint Task Force of a land component with appropriate air, maritime, and special operations components that will rapidly respond in a NATO contingency.[24] Considering the responsiveness needed, the UTO concept will be foundational to air component planning and execution as part of the task force. The limited capabilities and vast distances in Africa provide more opportunities to apply UTOs. Africa Command and its components are developing a hub-and-spoke concept of operations whereby forces would deploy to a MOB hub and then "spoke" to less-capable airfields for short-duration operations—a scenario for which UTOs have applicability.

These operations also present opportunities for functions across the agile combat support portfolio to rethink the delivery of capabilities. New strategies for the storage and distribution of war reserve materiel (WRM) could include the purchase of selected WRM for pre-positioning or possibly redistributing existing WRM assets by pre-positioning them at FOLs. Combat skills training for all Airmen should also be

reevaluated and perhaps expanded beyond current projected levels. Proficiency in basic "shoot, move, communicate" skills can reduce the necessity of security forces by enabling all Airmen to participate in FOL defense. Since an order to support UTOs can occur with little notice, Airmen should routinely practice their combat skills. Furthermore, at an austere location in the A2/AD environment, every Airman should have an assigned "battle station" in the event of a ground attack. These "fight-the-base" concepts have been developed and fielded in the past and could be revived. Unit type code packages might also need tailoring. As with combat skills, aircraft maintenance personnel should be cross-trained to the maximum extent possible, further reducing the demand for "boots on the ground." Moreover, most of the modern airfield damage repair capability is currently targeted for the Pacific theater. Given the urgency of the resurgent Russian threat, additional repair kits should be purchased and allocated to the European theater. As resources become available, these kits should eventually be pre-positioned along with WRM at FOLs across Europe. NATO and partner nations could fund these resources.

Conclusions

The foundational concepts of UTOs—FARP, NATO cross-servicing, and Rapid Raptor—have proven sound. UTOs offer a tremendous opportunity and options for decision makers across many fronts in both planning and execution. Resourcing, training and exercising, interoperability goals, associated guidance, and NATO / partner nation agreements as viewed through the lens of the UTO present many chances to gain synergy. As the UTO concept develops, these factors and others will sharpen our focus on the common goal of increasing combat capability to assure and deter.

As the four British F-35s touched down at Câmpia Turzii Air Base in Romania, Romanian Airmen poured from base operation buildings. The ramp came alive again as Airmen quickly began preparing to rearm and refuel the jets—their third flight of fighters for the night. The jets were back in the air within the hour, and the Airmen made sure the base was ready for the next planes. The war was going well; untethered sortie generation had unleashed the asymmetric advantage of US, allied, and coalition airpower. The Russians simply could not match the flexibility and capacity of alliance and coalition command and control, mobility, and logistics. ✪

Notes

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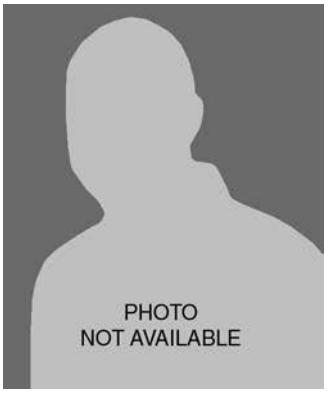

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