The Tyranny of Time and Distance: Bridging the Pacific

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As discussion swirls about transforming the Army, people focus on strategic deployability and naturally associate that with smaller, lighter Army platforms to fit on existing Navy and Air Force craft. But what if the mobility solution involved fundamentally different transportation—something that flew like an airplane and rivaled the capacity of a modest ship, yet traveled so low and fast that it had stealth greater than either? We have the technology. Rather, the Russians do, and the US military merely needs to decide whether to exploit the capabilities of powerful, efficient transports that can fly across the ocean in ground effect.

With the end of the Cold War, the threat of global war receded and debate resumed whether the United States needs to prepare for two simultaneous major theater wars. No major peer competitors should emerge over the next two decades; however, the emergence of a coalition of states hostile to the United States could emerge as a threat by the end of the decade. The most probable threats to US national interests will come from failed states, transnational actors and competitors for resources. The bulk of the US Army will be stationed in the Continental United States (CONUS) but will deploy on force projection missions throughout the globe.

Therefore, the US Army has a marked interest in overcoming the tyranny of time and distance. While serving as commander in chief, US Transportation Command, General Walter Kross pointed out, while aircraft may deploy some forces and their equipment to distant theaters, sealift will continue to be vital since "95 percent of dry cargo and 99 percent of liquid cargo will likely move by sea."[1]

In no other theater is strategic deployment so daunting as in the Pacific. Commander in Chief, US Pacific Command (PACOM), US Navy Admiral Dennis C. Blair noted that fostering a more secure Asia-Pacific region remains the primary goal of PACOM and that "deployed, ready and powerful Pacific Command forces" are the best foundations for the region's security and development.[2] Pre-positioned stocks and forward-deployed forces are the first echelon of American engagement and security in the region, but only linkage to strategic forces in CONUS

can effectively sustain national commitments and engage in compellence. While it is no silver bullet, one older technology can assist the Army in projecting global power.

In 1998, the US Army marked a century of engagement in the Pacific and Far East. During that century, the Army proved a key factor in American forward presence and power projection during peace and war. Its presence was necessary to deter conflicts, work with allies and friendly states, support humanitarian assistance and win the nation's wars in this vast region. This year, Americans mark the Korean War's 50th anniversary. Korean War historian and veteran, T.R. Fehrenbach observed that, "Americans in 1950 rediscovered something that since Hiroshima they had forgotten: you may fly over a land forever; you may bomb it, atomize it, pulverize it and wipe it clean of life—but if you desire to defend it, protect it and keep it for civilization, you must do this on the ground the way the Roman legions did, by putting your young men into the mud."[3]

The US Army's century of the engagement in Asia began with the Spanish-American War. US naval power destroyed Spain's Pacific Squadron, but it could not occupy and hold the Philippines. There was a long delay between Commodore George Dewey's victory at Manila Bay on 30 April 1898 and the eventual arrival of a US Army force in the Philippine Islands. This delay created a political-military sovereignty gap and allowed an insurrection to grow which opposed incorporation into the United States. The first of three contingents from Major General Wesley Merritt's Philippine Expedition left San Francisco on 25 May 1898 and arrived in Manila on 30 June 1898; the last contingent arrived on 25 July 1898.[4] The expedition's delay allowed Filipino nationalist Emilio Aguinalda to organize a native army and begin an armed struggle for national independence which led to a full-fledged insurgency against American rule until 1902.

While the role of the United States and its Army in the Asia-Pacific region has changed over the past century, the continuing tyranny of time and distance in the Asia-Pacific area still dominates strategic plans and concepts. By World War II, sailing times had been slightly reduced, but even today moving troops, equipment and supplies requires 21 days by sea from Oakland, California, to Manila, Philippines, and 16 more to reach the western limits of the PACOM and US Army Pacific (USARPAC) area of responsibility in the Indian Ocean. A recent report by Secretary of Defense William Cohen observed, air movement times across the Pacific are measured in hours, but sailing times still reflect "the tyranny of distance—19 days from Seattle to Thailand, 18 days from Alaska to Australia and 10 days from Hawaii to Korea."[5]

Pre-positioning materiel, a Cold-War era solution, arose out of shared threat perceptions and alliance arrangements that developed during that era. Those alternatives mitigate but do not overcome the tyranny of distance and depend on continued shared interests at a time of dynamic changes in the Asia-Pacific security environment. The revolution in military affairs has yet to conquer the tyranny of time and distance for US ground forces that must deploy from CONUS to the far reaches of PACOM's area of responsibility.

US engagement in the Asia-Pacific region divides into two epochs and an epilogue. That experience demonstrates how vital US Army presence has been in providing regional stability and protecting American interests. The first epoch was dominated by a rivalry between Japan and the United States. China was weak and divided. Russia was unable to defend its far-eastern

territory. The epoch began with the Sino-Japanese War of 1894 and ended in 1945 with the Japanese surrender on the battleship USS *Missouri* in Tokyo Bay.

In the first half of the 20th century, the US Navy was the Pacific military power center of gravity. US War Plan "Orange" (War with Japan) reflected this geostrategic calculus. The Army's primary role until Pearl Harbor was to defend the Philippines, far from CONUS and very close to the Japanese Empire. The US Navy's inability to reinforce the Philippines after the disaster at Pearl Harbor condemned the American and Filipino defenders to an uneven struggle. When the American defense ended tragically on Bataan, Philippines, in early 1942, it was the worst US defeat during the entire war. During the American counteroffensive, naval and air power proved the decisive instruments in carrying the war across the Pacific.

These forces made possible Army and Marine amphibious advances across the Southwest and Central Pacific Theaters. On the verge of the invasion of the Japanese home islands, President Harry S. Truman decided to avoid inevitable large-scale casualties and employed atomic weapons to force the Japanese to surrender. Thereafter, nuclear weapons would be a primary factor in the US military presence in Asia and an ingredient in the management and resolution of Asian security issues.

In 1947 the United States granted Philippine independence after securing a naval and air basing agreement with the elected government. The United States supported a successful counterinsurgency struggle against the Hukbalahap communist guerillas.

The second half of the century, and second Pacific epoch, was dominated by the Cold War. This confrontation took on strategic dimensions in the Pacific with the triumph of communism in China, the detonation of the first Soviet atomic bomb, the Soviet-supported North Korean invasion of South Korea, and the signing of the US-Japanese peace and security treaties. The Cold War was cold in Europe but hot in Asia.

During the Korean War one of the initial, central problems was timely deployment of forces from CONUS to stabilize the defense and create a strategic reserve to regain the operational-strategic initiative.[6] This "policy war" or "police action" was the wrong war, in the wrong place, at the wrong time. But the US Army found itself committed to full-blown war with an intractable opponent half a world away. A negotiated settlement and not military victory defined the end of the contest, and strategic planners were quite certain that future wars would be won by air power and massive nuclear retaliation. Politically, the broad outlines of US Pacific presence were forged by the end of the Korean War. There would be a military forward presence on the Korea Peninsula, in the Taiwan Straits and across Southeast Asia. The United States deployed a large military infrastructure in Asia, especially in the Philippines and Japan.

In 1964, amid deteriorating Sino-Soviet relations, the People's Republic of China tested its first nuclear weapon. At the same time, the United States assumed the burden of opposing communism in Vietnam following the French defeat there. That commitment, which began as assistance to the South Vietnamese counterinsurgency effort, became America's largest and longest war of the Cold War era.

American withdrawal from Vietnam and the defeat of the South Vietnamese regime led to a new phase of the Cold War in Asia after 1975. Korea remained stable, thanks to US military presence and the economic transformation of the South. Japan became a global economic power among a series of Southeast Asian economic miracles. In this geopolitical context, the United States' rapprochement with China leveraged the Cold War to the US advantage. Playing the "China card" became a vital part of the East-West confrontation as detente gave way to another round of confrontations. China began a market-driven economic transformation although the Chinese Communist Party maintained its political monopoly on power. In the later 1980s and early 1990s the Cold War ended in Asia with Soviet disengagement, following their domestic crisis and imperial overreach. The US Army in the Pacific played a crucial role in the final victory in the Cold War by providing a credible military deterrence and presence in Asia, especially in Korea.

It is now the end of the first decade of the post-Cold War era. Changes in the Pacific security environment raise serious questions about timely and effective deployment of American land power into theater during the 21st century. While the United States still retains a vast forward infrastructure in Korea and Japan, new dynamics in the Pacific and Asia raise the prospect of conflict. Instability in Indonesia and the international military intervention in East Timor, the explosion of nuclear weapons by India and Pakistan, the recent fighting over Kashmir, China's disputed claims to the Spratley Islands and the growing belligerency of China toward Taiwan point towards the possibility of regional military conflict.

Open discussions of an alliance among Moscow, Beijing and New Delhi to counter what its architects call globalism and US hegemony could well be a harbinger of new Eurasia tensions. These developments make it imperative that the US Army overcome the tyranny of time and distance to maintain credible influence as a projected force in this theater. The Army still cannot deploy large forces across the Pacific much faster than it did in 1899. What could expedite movement in the vast Pacific could also expedite deployments from CONUS to Europe, the Middle East and the Indian Ocean in crisis situations. Does such a prospect exist and can US military strategy and the US Army benefit from its realization?

Spotlighting a Technological Alternative

Strategic maneuver is an inherent characteristic of the US Navy and Air Force. Naval presence has been a feature of sea power since the age of sail. As navies grew to command the sea, they have been able to apply pressure through blockades. Modern naval theory since Alfred Thayer Mahan has viewed advances in naval technology as enhancing this role. With decline of the only oceanic contestant for the US Navy's command of the sea, chiefs of naval operations have championed a new strategic naval role. This vision incorporates precision, deep-strike weapon systems and amphibious capabilities to project power "Forward from the Sea" as an instrument of littoral warfare. Air power champions since Emilio Douhet, Sir Hugh Trenchard and Billy Mitchell have championed command of the air and deep strike capabilities so that air forces could influence the conduct and course of war. From the flight of the experimental B-15 to Latin America on a humanitarian mission in the 1930s to modern, nuclear-armed, intercontinental bombers and ballistic missiles, strategic aerospace mobility has been a vital component of US national strategy. Stealth aircraft and deep, precision-strike conventional weapons have given the US Air Force the capability for "virtual global presence"—as B-2 strikes from Whiteman Air

Force Base, Missouri, against targets in Yugoslavia manifested. Both the Navy and the Air Force possess the ability to deploy and sustain timely, credible combat capabilities into distant theaters. Forward infrastructure provides support and sustainment in many regions of the globe. Naval forces give the US Marine Corps the ability to fight abroad.[7] But the Marine Corps lacks the critical land power mass to engage in strategic maneuver in distant theaters. The Army has the critical mass to conduct such maneuver but lacks the strategic mobility to overcome the tyranny of time and distance. Until the Army acquires the capability to deploy timely, significant land power into theater, the United States will not have a truly joint force posture to address the full spectrum of operations.

With the Cold War's end, the Army changed from a forward-deployed power to a primarily CONUS-based force-projection power. The Army is dependent on the Navy and Air Force to get it to the fight on time. Yet, there have been no sweeping concurrent changes in the transport capability of the Navy or Air Force to support this new Army mission. Therefore, despite the best efforts of the sister services, the enormous combat power of the Army is essentially a nonplayer in a far-off, fast-breaking situation. Army Chief of Staff, General Eric K. Shinseki, has recognized this problem and has moved to address it. During a time of high operational tempo, Shinseki has articulated a vision for the 21st-century Army: "Soldier on point for the nation transforming this, the most respected Army in the world, into a strategically responsive force that is dominant across the full spectrum of operations."[8]

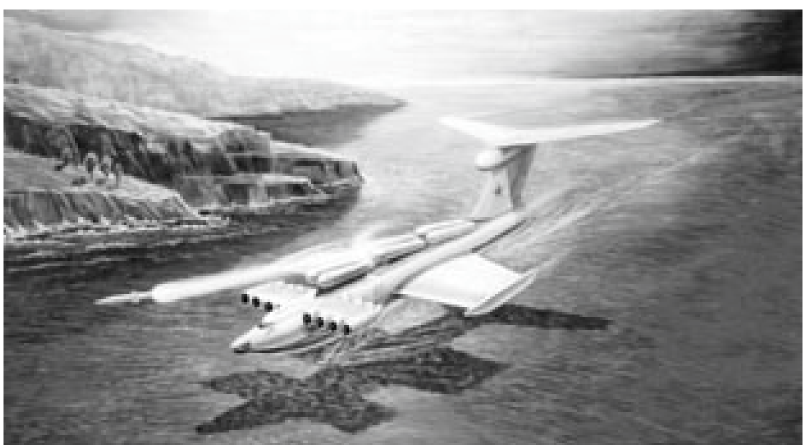
He addresses the Army's serious logistic problem. "Today, 90 percent of our lift requirement is composed of our logistical tail. We are going to attack that condition both through discipline and a systems approach to equipment design. We are looking for future systems which can be strategically deployed by C-17, but also able to fit a C-130-like profile for tactical intratheater lift. We will look for log support reductions by seeking common platform/common chassis/standard caliber designs by which to reduce our stockpile of repair parts. We will prioritize solutions which optimize smaller, lighter, more lethal, yet more reliable, fuel efficient, more survivable solutions. We will seek technological solutions to our current dilemmas.[9]

In line with this vision Shinseki ordered the creation of a brigade combat team that can rapidly deploy on current US Navy and Air Force vessels and aircraft. This brigade, outfitted with new equipment, should reduce logistic tonnage requirements by 50 to 70 percent and allow the brigade to deploy anywhere in the world within 96 hours. Further, the Army should be able to deploy a division within 120 hours and five divisions within 30 days. The deployment time of the multidivisional force still reflects the tyranny of time and distance that has dominated the global reach of land power in the 20th century. The current sealift requirement, which calls for 36 roll-on/roll-off ships, does not represent an effective increase in deployment speed and requires an operational arrival port.[10] Further, a 1991 Rand Study notes that the US Merchant Marine is troubled by the decline of dry-cargo ships from 300 to 200 during the 1980s and a projected decline in military sealift capacity by 2010. The study recommended modernizing sealift and making it fast. For conventional hulled vessels the term "fast" meant an increase from 20 knots to 30+ knots. A Surface-Effects-Ship (SES) option under study used a catamaran hull with an air cushion and had a speed of 55 knots but this design was judged technologically risky.[11]

This tyranny of distance drove the Chief of Army Field Forces, General Lesley McNair, to radically recast the robust but ponderous square infan-try divisions of World War I into leaner, more mobile, triangular divisions that deployed globally and won victories in the European and Pacific theaters.[12] Deployability, however, involved costs. To give his infantry divisions offensive punch, McNair pooled assets to increase combat power. To sustain global deployability, McNair reduced the weight of armored forces by using light tank destroyers and medium tanks, whose armor protection and fire power were inferior to German Panther and Tiger tanks. The trade-off between deployability and combat power was particularly felt during the bitter initial fighting in the Bocage of Normandy.

Shinseki, like McNair, faces the twin challenges of making a force-projection Army more deployable, more maneuverable, more survivable and more lethal. The challenge of the initial brigade combat team is to guarantee that it retains crucial combat power, survivability and endurance for decisive maneuver. Backing up the brigade with the rapid deployment division is the most effective way to guarantee that the brigade's combat power will dominate stability and support operations and will readily prevail in the case of hostilities. Both the brigade and division will rely heavily on airfields for their deployment.

Their Achilles heel in crisis is the 30-day delay in the deployment of a corps to theater. Opposing forces may seek to win before the full force can reach the theater and to engage Army forces in terrain that demands manpower and negates high-tech weaponry. In Europe, rail movement greatly facilitated deployment of US Army ground combat power from Germany to the Balkan theater, and the success of the Implementation Force depended on the staging area in Hungary. However, in many theaters, sealift is still the only way to get large forces into theater. This was true during the Gulf War and would certainly be true of any conflict in the Pacific.



An artist's conception of a UTKA-Class WIG which appeared in the 1988 edition of *Soviet Military Power*. This craft, similar in size to the "Caspian Sea Monster," was intended for coastal defense and sea control. More than a half-dozen variants of WIG craft were built, and many of them continue to operate over the busy Caspian Sea.

While the Army experiments with the creation of a lighter, more agile force, a comparatively old technology could solve the Army's dilemma by providing rapid, inexpensive, long-range, heavy-

lift capability that does not require a seaport or an airport for departure and arrival. This technology can transport lightened versions of the Army's lethal heavy divisions and their logistics so that there is no loss of combat power. That proven technology, wing-in-ground (WIG), has been around for 65 years. The Soviet Union experimented with this technology and built a series of *ekranoplans* (screen gliders) for a wide range of missions. Russia continues to support the development of the *ekranoplan* for its own navy, other services and foreign sales.[13]

Getting There First with the Most—on the Cheap

Do you want it there fast or do you want it there cheap? This trade-off has always been a concern of manufacturers, merchants and logisticians. When the shipment is transoceanic, sea travel is the cheapest. Air shipment is faster but costs five times more per kilogram of weight.[14] However, WIG technology can deliver large amounts of cargo with significantly less fuel consumption than aircraft—50 percent more payload with 35 percent less fuel consumption than similar-sized aircraft and 75 percent less fuel than comparable-sized hydrofoil ferries. Further, the infrastructure requirements for WIG technology is substantially lower than for aircraft or ships.[15] WIG craft travel nearly as fast as aircraft using much less fuel. They are normally based on a body of water but can take off and land on ground or water and do not need a developed airfield or port to function.

The WIG effect refers to the dense cushion of air that develops between a wing and the water (or ground) surface when they are close together. Seabirds use the WIG effect to skim the water's surface, for hours at a time, barely flapping their wings. Every aircraft experiences the WIG effect as it takes off and lands. Pilots of damaged aircraft conserve energy or use the power of remaining engines more efficiently by dropping down to sea-skimming level to use the WIG effect—although most aircraft are not designed for long-range, low-altitude flight. The closer the wing is to the ground (or water), the greater the amount of lift. The larger the WIG craft, the more efficient it is when compared with a smaller craft flying at the same altitude. The figure shows how placing a winged craft in ground effect produces the effect of a much larger wing area without actually increasing wing size.[16]

WIG technology has particular appeal to military logisticians. WIG craft can move heavy loads rapidly across the ocean and land—on an undeveloped beach or further inland—and can fly around bad weather. Since it is flying 3 to 90 feet above the ocean surface, it is hard to detect using radar, infrared or satellite. It can presently fly in excess of 400 miles per hour and carry over 500 short tons.[17] WIG craft can fly over water, sand, snow or prairie. It can also fly up to an altitude of 3,000 meters, but then it loses its fuel-saving advantages. Russian analysts consider WIG technology so developed that the United States could build a 5,000 ton, ocean-skimming WIG craft with a 1,500-ton capacity, 20,000 kilometer (12,420-mile) range, and a 400 kilometer-per-hour (250 mile-per-hour) speed. Such a craft could deliver 1,200 tons of military equipment and cargo plus 2,000 soldiers.[18]

WIG craft externally resemble airplanes. They have two huge wings mounted on the hull. The craft uses a turbofan/turboprop or a jet aircraft engine for propulsion. It employs a vertical rudder, horizontal rudder, wing flaps and a stabilizer to control the craft's heading and maintain its flight altitude. Its fuselage and wing structure share aircraft characteristics. Most of its on-

board equipment and instruments come from aircraft. Yet, a WIG craft is not an aircraft. An aircraft relies on the flow of air past the wings for the lift needed to fly. A WIG craft uses ground effect to fly low—between 0.8 and 30 meters above the sea's surface. Most aircraft cannot do this for extended periods.[19]

A Bit of History

Research on WIG effect began in the 1920s. In 1935 the first WIG craft were patented in Finland. Finnish engineer T. Kaario built what he called the "wing-ram" craft in that year.[20] The Soviets began building such craft in the late 1950s and gave the prototypes the designation *ekranoplan*. In 1963, the "Caspian Sea Monster" appeared on the waters of the Soviet Union. It was 92 meters (100 yards) long and 22 meters (24 yards) high with a 37-meter (40.5-yard) wingspan. Nicknamed the *Korabel Maket* (ship model), it could lift off at 544 tons and cruise at 280 miles per hour (mph). Lift and thrust were provided by thirteen 98kN (kiloNewton) turbojet engines. Eleven of the engines lifted the craft from the water and two provided its cruise power. It took off and landed on water and flew at 10 feet above the surface.[21] Due to its shallow draft, it could load and unload in shallow, undeveloped ports.[22] This craft crashed in 1980.[23]

The Soviets went on to build other smaller WIG craft. The first, *Orlyonok* (Eaglet), of a planned 120 appeared in 1972. It was 58 meters (63.5 yards) long, 16 meters (17.5 yards) high with a 31.5-meter (34.5-yard) wingspan. It could lift off at 140 tons and carry 20 tons of cargo. Two 98kN turbofan engines provided the lift while a 11.3 MW turboprop engine provided the cruising speed of 217 mph at 6 feet above the water's surface. Three of these craft were actually built.[24] The Central Hydrofoil Design Bureau, named after R.E. Alekseev, located in Gorky (now Nizhni Novgorod) designed and built the *Lun'* (Harrier) and *Spasatel'* (Rescuer) WIG craft for the Soviet and Russian Navy. It also built the small *Strizh* (Martin) WIG trainer craft. At least five other variants of WIG craft were also built—many of them still operating safely over the busy waters of the Caspian Sea.

Since the collapse of the Soviet Union, Russia has continued to research, design and produce WIG craft for domestic and international sales. In addition, Great Britain, China, Germany, Finland, Japan, South Korea, Australia and Montenegro have all conducted WIG craft research and production. The US Air Force considered WIG technology but built the C-5 instead.

China, a great power in the Pacific, is particularly interested in WIG technology. Chinese analysts attribute the following advantages to WIG craft over conventional ships and aircraft:
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- Superb mobility. A WIG craft travels above the water's surface in air that is 800 times less dense than water. Traveling in air greatly decreases the drag exerted on ordinary vessels and greatly increases the craft's speed. Fast sea transports have a top speed of 20 knots. A conventional warship has a maximum speed of 30 to 40 knots, and although the hulls of hydrofoil craft and hovercraft travel above the water, their hydrofoils and their aprons still come in contact with the water. Thus, their speed is limited to between 70 and 80 knots or less. But a WIG craft can travel between 300 and 400 knots.

- Superb airworthiness. A WIG craft is very airworthy and can fly around bad weather or above a stormy sea. Since a WIG craft is not pounded by storm waves, it is also remarkably seaworthy.
- Ease of operation. A WIG craft is controlled through its vertical rudder, its elevator and its wing flaps. It is simpler to fly than an airplane, and it turns easily.
- Economical operation. Pressure under the wings of a WIG craft increases greatly by flying fairly close to the water. Consequently, only 80 to 130 horsepower are required to propel each ton of weight. The high lift-drag ratio means that fuel consumption is lower and cruising radius is greater than similar-sized aircraft. WIG craft are far superior to ordinary aircraft and helicopters in carrying capacity, speed and cruising radius when using the same power.
- Convenient maintenance. WIG craft do not need permanent shore bases. Unlike other high-speed craft, they can come ashore under their own power and do not need cranes or chutes. Furthermore, since they have no aprons like hovercraft, maintenance is very convenient. WIG craft do not have to make a gliding takeoff from the water or land on the water like seaplanes, which reduces corrosion from sea water.
- Diverse flight modes. WIG craft fly quickly and steadily above water, beaches, marshes, grasslands, deserts, glaciers and snow-covered land.
- Flight safety. Should the engines fail, WIG craft can travel on the water like conventional ships. These stable craft have operated for many years. Some WIG craft vent their engine exhaust forward beneath the wings of the craft to increase dynamic lift, assist takeoff and improve amphibious performance and flight safety.
- Military applications. The speed, maneuverability, amphibious capability and stealth of WIG craft are greater than that of other craft. Their fast, low-altitude approach may allow them to become the next generation of fast-attack craft, replacing hydroplanes and hydrofoils.

Since WIG craft usually fly within 50 meters of the surface, they are in the blind zone of radar sweep and search. The ultralow altitude of WIG craft leaves no traces on the water's surface and is difficult to detect by radar, which greatly increases the concealment and surprise attack capabilities of the craft. This extraordinary concealment capability has extremely important military significance. WIG craft may be used as landing craft and for rapidly and effectively moving troops in a campaign. The low flying altitude, the long cruising radius and the carrying capacity of WIG craft may be increased. WIG craft are also suited for antisubmarine patrol craft, high-speed minelayers, minesweepers and rescue craft.[25]

Neither Fish Nor Fowl

A US Army separate mechanized brigade, with all its personnel and equipment, weighs in at 26,649 short tons (69,623 metric tons) and requires 97 containers (20-foot) for conventional shipment.[26] This brigade could be moved on 11 WIG craft, each designed to move 2,500 tons. So, why don't the US Armed Forces have WIG craft to move the Army rapidly where it is needed?

The first issue—is a WIG craft a naval or an air asset? The US Navy has not included WIG craft in its future procurement program, probably because no surface vessel in the entire Navy can

keep up with it. While the Navy did have a long relationship with American seaplane designers from Glenn Curtis to Howard Hughes, the Navy lost interest in seaplane development in the 1950s when it discounted jet-powered seaplanes as a nuclear bomber platform. Interest in transport seaplanes ended a decade earlier with the abandonment of Howard Hughes' H-4 "Hercules" prototype—a project designed to enhance strategic deployment capabilities over long distances. There was one flight by Hughes' enormous Spruce Goose flying boat. On 2 November 1947, it flew 70 feet over the water for one mile at a top speed of 80 mph. It was the first and only example of a large-platform WIG flight in US history.[27] Successful WIG development could pose a serious challenge to existing naval platforms because WIG warships would have tactical and technical characteristics far superior to existing surface warship classes, and a naval race over the application of WIG technology to warfare at sea could negate capital advantages that the US Navy enjoys with its current surface combatants.

The H-4 Hercules, better known as the Spruce Goose, during its only test flight, Longbeach Harbor, 2 November 1947. The H-4 was designed to carry two tanks, 750 troops or 420 stretcher cases on two decks.

The US Air Force is also not interested and does not procure transport aircraft that can routinely operate from dirt or water. The Air Force prefers to operate only from permanent hardstand airfields. However, the need for rapid strategic deployability, which drove the development of Hughes' flying boat, is a chief concern for US defense planners and a major consideration in transforming the Army.

Since WIG craft do not fit neatly in either the Navy's or Air Force's comfort zone, and since the Army is the only service without strategic mobility, perhaps the WIG craft belongs in the Army as part of Army Aviation or the Transportation Corps. With WIG craft, the Army could move its heavy elements rapidly to the crisis area—regardless of the presence or lack of secure ports and airfields. The Army could deploy with full combat power while the Navy and Air Force could continue their traditional Title 10, *United States Code,* roles by providing longer-term logistic support. WIG technology is not new and other countries are adopting it. Perhaps it is time for the United States to embrace this technology and provide strategic mobility to its Army.

WIG: Enhancing Timely Deployment

WIG technology is not the sole solution to overcoming the tyranny of time and distance in the Pacific and other theaters. But it does represent a potential force-deployment enhancement at a time when the United States retains a wide range of distant commitments and faces the prospect of serious declines in forward infrastructure.

Upcoming negotiations with Japan over sharing defense burdens may provide some indications on the probable scope and scale of US defense infrastructure that will be in place in 10 years.[28] In South Korea the government has undertaken an expanded defense burden, assuming the eventual withdrawal of US forces from Korea.[29] North Korean seems to have stabilized its domestic situation and continues to pour resources into its military establishment—a point made by General Thomas A. Schwartz, commander in chief, United Nation Command/Combined Forces Command and Commander US Forces, Korea, in his recent testimony before the Senate Armed Services Committee.[30] Recent defense budget increases in the People's Republic of China and greater stridency over the issue of Taiwanese independence have gone hand-in-hand with a developing arms race in Asia and threaten conflict in the region.[31] When the destabilizing developments in the Indian Ocean are added, the requirement becomes pressing for the United States Army to overcome the tyranny of time and distance and be the cornerstone of US power projection in the Pacific. Compelling reasons abound for a second century of American presence in the Pacific—and elsewhere. WIG might just get us there.

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4. Brian McAllister Linn, *The Philippine War*, 1899-1902 (Lawrence: University Press of Kansas, 2000), 13-15.

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10.Defense Technical Information Center (DTIC), *Mobility Forces* (Fort Belvoir, VA: DTIC, 1997), <http://www.dtic.dla.mil/execsec/adr95/mobility4.html> .

11. Myron Hura and Richard Robinson, *Fast Sealift and Maritime Pre-positioning Options for Improving Sealift Capabilities* (Santa Monica, CA: Rand 1991), iv-xi. Short-term advantage in initial speed of SES deployment are quickly overcome by the improved conventional transport's cargo tonnage over time. The marginal speed advantage of SES model is clearly not worth the costs and risks. An SES is not wing-in-ground which offers a radical increase in speed and enhanced cargo handling capabilities. The WIG vessels would be designed to meet military cargo requirements in order to enhance speed of loading and unloading and would be designed to work over the beach and not through congested ports.

12. Russell F. Weigley, *History of the United States Army* (New York: MacMillan, 1967), 461-471.

13. V.I. Denisov, "*Spasatel* Search and Rescue *Ekranoplan*," *Sudostroenie*, (January 1995), 9-12; Viktor Mikhailovich Ratushin, "Air Force Day: The Border Knows No Calm, Just as the Border Troops Aviation Does Not," *Armeiskiy sbornik*, (August 1997), 27; and opening statement by E. Primakov, Minister of Foreign Affairs of Russia at the Fourth ASEAN Regional Forum Meeting in Kuala Lumpur 27 July 1997, as reported by World News Connection (FBIS): FTS19970727000502. The *Spasatel'* search and rescue *ekranoplan* has a displacement of 500 tons and has been developed for the Russian navy to provide rapid search and rescue capabilities in the case of major maritime disasters like the loss of the SSN *Komsomolets* in 1989. Russia's Federal Border Guard Service, according to its commander General Lieutenant Ratushin is studying the development of both ekranolet and *ekranoplan* technology. Foreign Minister Primakov used the ASEAN summit in 1997 to support the development of a regional search and rescue center employing the Russianmade *Spasatel*' system. The *Spasatel'* is a conversion of the *Lun*' combat *ekranoplan*, which was designed by the R.Ye. Alekseyev Central Design Bureau of Hydrofoils Scientific Production Association (now the Central Design Bureau of Hydrofoils Joint Stock Company and the Volga Shipbuilding Factory Joint Stock Company). According to its technical specifications, *Spasatel'* has a weight of 400 tons and a cruising speed of 300-400 kilometers per hour. It is powered by eight twostage NK87 turboprop engines, and can carry up to 500 persons and has a range of 3,000 km.

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