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Japan is essential to U.S. military strategy in Asia. The Japanese archipelago is home to some of the largest and most important American forward bases in the world, enabling the United States to project power in the region and beyond. Japan's world-class Self-Defense Force not only augments America's strategic influence, but also shares the operational burdens of defending maritime Asia. As like-minded powers, Tokyo and Washington, D.C. attach enormous value to the norms and values that regulate the global order. For more than six decades, the U.S.-Japan alliance has presided over the region's peace and prosperity so central to the integrity of the current international system.

But China's rise, particularly in the military sphere, threatens to unsettle the U.S.-led status quo. During the past two decades, China has built up an array of military forces, including its conventional missile forces, designed to complicate and even preclude American and allied operations across large swathes of maritime Asia. Known as an "anti-access/area denial" strategy, Beijing seeks to hold the United States and its allies at bay in the event that China fights in a major regional conflict, such as a war over Taiwan.

China's growing capacity to keep out third parties is challenging long-held assumptions that have underwritten the U.S. posture in Asia. In wartime, Chinese naval, air, and missiles forces would contest allied use of the seas, airspace, and bases in the western Pacific, including those located along the Japanese archipelago. There is strong evidence that China's military, the People's Liberation Army (PLA), is developing a missile arsenal targeted in part at bases in Japan, raising questions about the alliance's ability to fight effectively should deterrence fail. The bottom line is that Washington can no longer take for granted unfettered access to U.S. bases across Japan in wartime. It is thus important to understand Chinese perceptions of Japan's basing infrastructure and how China might seek to employ its missiles to preclude or degrade allied use of the air bases and naval facilities so essential to deterrence and warfighting.

The Importance of U.S. Bases in Japan

Japanese bases are the foundation of U.S. strategy in Asia. Japan's proximity to potential flashpoints in Asia enhances allied deterrence while maximizing early warning, rapid crisis response, and wartime mobilization, should deterrence fail. Without Japan, the United States would lose an irreplaceable foothold from which to radiate combat power along the East Asian littoral. As one analyst notes, "The American military would be significantly less effective without access to these forward operating bases, and their loss could be the difference between victory and stalemate—or worse."[1]

The Japanese archipelago hosts an unmatched share of U.S. combat power in Asia. Japan is home to roughly 50,000 American military personnel (about 38,000 ashore and 11,000 afloat), over eighty facilities under exclusive American control, the Seventh Fleet, the Fifth Air Force, and the III Marine Expeditionary Force.[2] Kadena Air Force Base is "the largest U.S. installation in the Asia-Pacific region" and deploys "the largest operational combat wing overseas in terms of the number of aircraft assigned."[3] Yokosuka Naval Base supports the U.S. Navy's only permanently forward-deployed aircraft carrier, USS *George Washington* (CVN 73), while the III Marine Expeditionary Force is the only division-sized fighting unit based outside of the United States.

Chinese Views of U.S. Bases in Japan

Chinese strategists view U.S. bases in Japan as places from which the United States could intervene in Beijing's affairs. Taiwan remains the animating force behind China's strategic calculus. The PLA's inability to respond to the display of U.S. naval power at the height of the 1996 Taiwan Strait crisis proved highly embarrassing. This galling experience steeled Beijing's resolve to preclude U.S. naval deployments near Taiwan in a future crisis. Notably, the Yokosuka-based USS *Independence* (CV 62) took station off Taiwan's east coast in March 1996, cementing Chinese expectations that Washington would dispatch a Japan-based carrier in a contingency over Taiwan.

Other territorial disputes along China's nautical periphery could involve U.S. intervention. A military crisis arising from a Sino-Japanese encounter at sea over the Senkaku/Diaoyu Islands could compel an American reaction. Recent Chinese attempts to enforce territorial claims over large swathes of the South China Sea have stoked regional tensions. If a local tussle there escalated into a larger conflagration that threatened international shipping, the U.S. Navy might be ordered to maintain freedom of navigation. Chinese analysts anticipate that the U.S. carrier based in Japan and other strike groups operating near Asian waters could be called upon as first responders.

Beyond crisis or conflict, Chinese analysts are acutely sensitive to regular peacetime surveillance and reconnaissance activities along China's periphery launched from Japan. They point out that RC-135 and EP-3E aircraft flying out of Misawa, Kadena, and Atsugi airbases can intercept signals emissions deep inside Chinese territory.[4] Notably, the EP-3 aircraft forced to land on Hainan Island following a collision in international airspace with a Chinese J-8 fighter in April 2001 was launched from Kadena. Oceanographic survey ships and ocean surveillance vessels frequently operate out of U.S. naval bases in Japan, including the USNS *Impeccable* that Chinese vessels harassed in March 2009. The Chinese also pay close attention to the presence of F-22 stealth fighters and P-8 anti-submarine warfare aircraft on Kadena airbase, viewing these deployments as blunt deterrence signaling directed at China.[5] In August 2014, a Chinese Su-27 interceptor maneuvered dangerously near a P-8 conducting routine reconnaissance in international airspace over the East China Sea. The PLA is clearly pushing back against U.S. aircraft and ships originating from Japan.

At the operational level, Chinese analysts have carefully studied the extent to which U.S. global strategy rests on uninterrupted access to overseas bases. Indeed, they are well acquainted with

the centrality of foreign naval bases to seagoing forces, especially those forces that must operate far from the homeland for extended periods of time.[6] Chinese strategists recognize that rear-area support from shore bases is indispensable to sustained combat operations of a modern carrier strike group. In peacetime, a carrier and its accompanying fleet consume massive quantities of fuel, food, ammunition, and spare parts while placing nearly continuous demands on maintenance and repairs facilities.

During high-intensity combat operations, carrier-based naval aviation units require constant resupply of munitions while the carrier and other surface combatants need to be rearmed and refueled regularly. The replenishment fleet must shuttle between the carrier strike group and a network of bases that store these supplies to sustain continuous cruises at sea. Structural repairs and the replacement of military components, such as aircraft engines, rely on the direct support of major bases.[7] The Chinese appreciate the dynamic and complex interaction between frontline formations and the shore-based infrastructure that supports their operations.

Chinese strategists see U.S. forward basing in Asia as both a threat to Chinese interests and a critical vulnerability for the United States. Bases in Japan are the most likely locations from which the United States would project power in response to a contingency involving China. At the same time, Chinese planners are acutely aware of the apparent American dependence on a few bases to influence events in the region. Should access to and use of these bases be denied for political or military reasons, they infer, Washington's ability to fulfill its responsibilities in Asia could quickly unravel. It is this keen awareness that has informed Chinese missile strategy against U.S. bases in Japan.

Missiles: Weapons of First Resort

The importance of bases in Japan to U.S. strategy and China's sense of vulnerability to those bases in war and peacetime constitute the essential strategic context to the Chinese missile threat. For some time to come, the missile will be China's best answer to U.S. forward presence, power projection, and security commitments to treaty allies and friends. The Second Artillery's missile force enables it to deliver firepower well beyond the mainland shores, projecting the kind of power that current Chinese air and naval forces cannot match. Moreover, authoritative doctrinal sources suggest that missiles may be the only available tool at the Chinese military's disposal to conduct long-range strike missions against distant and well-defended targets like those located in Japan. As the *Science of Second Artillery Campaigns* observes:

> When the powerful enemy's allied military bases around our periphery are beyond our air arm's firing range,…thus making it difficult to carry out the overall operational advantages associated with firepower coordination among the armed services and service arms, conventional missiles can be used to implement harassment strikes against the military bases of the enemy's allies around our periphery.[8]

According to the latest edition of the *Science of Military Strategy*:

> In joint operations, conventional missiles are mainly used to strike those [targets]

> that other types of weaponry cannot reach or cannot hit, but at the same time are targets that pose a great threat to our military, that have an important influence on the course of operations, or that play a supporting role to the war as a whole.[9]

Long-range strikes against some bases in Japan would seem to fit the conditions under which only missiles, at least initially, would come into play. Large bodies of water, such as the Yellow Sea, East China Sea, and the Sea of Japan, separate Chinese attackers from Japanese targets while some major bases, like Yokosuka naval base and Misawa airbase, are located on the Pacific-facing coast of the Japanese islands. Moreover, Japanese warships, submarines, and aircraft would mount stiff resistance along the approaches to the homeland while land-based missile and air defenses and fighters would defend the airspace over Japanese territory. The prospects of Chinese air and naval units fighting through such heavily-contested airspace and seas may be unacceptably risky or costly. Missiles would thus take the place of airframes and ships—as well as the personnel that man them—to fulfill such strike missions. Indeed, missiles may well be the weapons of first resort for the PLA to soften up enemy defenses, opening the way for follow-on operations by air and naval units.

China's Theater Strike Missiles

The Second Artillery's growing missile prowess enables China to bypass fielded forces and directly attack bases in Japan. According to the Pentagon's latest annual report on the Chinese military, "The PLA is fielding conventional MRBMs [medium-range ballistic missiles] to increase the range at which it can conduct precision strikes against land targets and naval ships (including aircraft carriers) operating far from China's shores out to the first island chain."[10] The first island chain stretches from the Japanese main islands through the Ryukyus and Taiwan to the Philippines. Notably, the Pentagon reports for the first time in 2014 that "U.S. bases on Okinawa are in range of a growing number of Chinese MRBMs."[11] In its 2013 report, the National Air and Space Intelligence Center confirms that, "China is also acquiring new conventionally armed CSS-5 [DF-21] MRBMs to conduct precision strikes. These systems are likely intended to hold at-risk or strike logistics nodes, regional military bases including airfields and ports, and naval assets."[12]

The entire Japanese archipelago falls within range of Chinese conventional medium-range ballistic missiles and land-attack cruise missiles. Boasting a range of at least 1,750 kilometers, the DF-21C medium-range ballistic missile, if notionally deployed in central Jilin Province, can deliver its warhead to any target across Hokkaido, Honshu, Shikoku, and Kyushu.[13] Japan's four main islands are also within striking range of the ground-launched DH-10 land-attack cruise missile (LACM) with a reported range of at least 1,500 kilometers, if it is hypothetically launched from Jilin Province near the North Korean border.[14] In theory, the DF-21C and the DH-10 could land blows on such distant bases in eastern Japan as Yokosuka naval base and Misawa airbase. On paper, DH-10 cruise missiles fired from sites in central Jiangxi Province could reach Okinawa. The reported deployment of the DF-16 medium-range ballistic missile would add to the arsenal's threat to Japan.[15] With a possible range of up to 1,000 kilometers, the DF-16, if deployed to central Zhejiang Province, could easily attack Okinawa.

Since ballistic missiles and cruise missiles possess the ranges to strike the same set of targets across Japan, they can be used in combination. Several advantages accrue from using them together. First, numbers matter. Mass furnishes more options: more targets can be struck, larger salvos can be launched, and the missile campaign can be sustained for longer periods. Second, the missiles can share the burden of attacking bases. Certain targets requiring greater accuracy could fall to cruise missiles. Cruise missiles can also conduct follow-on strikes after the first waves of ballistic missile raids. Third, the radically different fight profiles of ballistic and cruise missiles would further stress, if not overwhelm, the enemy's ability to defend against the incoming missiles. Cruise missiles can fly at low altitudes and can be programmed to approach a target from virtually any direction, further complicating the defender's task of detecting and intercepting them. In the future, air-, ship-, and submarine-launched cruise missiles, if they become more widely available and are deployed in larger numbers, would give the PLA even more ways to deliver precision firepower.[16]

The Academy of Military Science's course instruction on waging military campaigns specifically identifies ground-, air-, and sea-launched missiles as important components of a larger "campaign firepower engagement."[17] Ground-launched missiles can cover long distances, hit targets accurately, and penetrate enemy defenses. Bombers can conduct deep surgical strikes from standoff distances while submarines and surface combatants can deliver long-range, precise, and destructive missiles. Notably, the "suddenness" of a sub-launched missile attack is described as "irreplaceable." The combined use of these weapons, in "joint firepower strikes" would clearly furnish the PLA a wide array of options to attack enemy bases.

Range, accuracy, and operational flexibility are not the only measures of China's missiles threat to bases in Japan, however. The size of the missile force that the PLA could employ to inflict meaningful damage to those bases is another critical variable. While a detailed numerical analysis of China's theater strike capabilities will not be attempted here, it is worth noting that quantity matters. Large bases with many high-value facilities, such as those on the Japanese islands, would require more than a handful of missiles to destroy or degrade. Base functions that can be repaired and restored quickly, like runways, must be kept unusable with repeated attacks. Moreover, targets that survived previous raids must be struck again. In wartime, missiles could fall prey to malfunction, outright misses, interception by enemy ballistic missile defense systems, and other low-tech methods by defenders to defeat the incoming missiles. Possessing adequate inventory to account for attrition is thus particularly crucial for ballistic missiles that can only be used once.

Indeed, Chinese analysts are keenly aware that the PLA's long-range missile force—a scarce, expensive, and capital-intensive commodity—must be reserved for the most important targets. As the *Science of Military Strategy* observes:

> Owing to the influence of such factors as the conventional missiles' destructive power, the quantitative scale of the missiles, and the costs of striking with conventional missiles, the types of targets suitable for conventional missile strikes are limited. The Second Artillery's conventional missile power is limited in its ability to strike the number of targets available while it is not economical to strike some targets using conventional missiles.[18]

The value of the targeted objects must correspond with the level of effort—measured in terms of the availability and the cost of the striking missile force—required to destroy those objects. In short, the Second Artillery must be good stewards of its precious resources.

At present, the modest number of conventionally-armed DF-21Cs somewhat limits what the Second Artillery can do with this specific class of missiles.[19] Employing the MRBMs against all U.S. bases in Japan would spread the force too thin, diminishing its overall impact. For now, the PLA would probably have to direct its crosshairs on some priority bases—or a single base—that it considers critical to the U.S-Japan alliance or sufficiently threatening to Chinese forces. For example, the PLA may choose to employ the DF-21C against one or a small number of bases on Honshu, including Iwakuni air station, Atsugi airbase, Yokota airbase, Yokosuka naval base, and Misawa airbase that are beyond the reach of the DF-16s and other short-range ballistic missiles. Or, it may strike a closer and very lucrative target like Kadena airbase. Even so, the DF-21Cs could potentially inflict severe damage. Against a select few, China may possess enough missiles to deliver several intense pulses of firepower before running out. The Second Artillery would likely employ the MRBMs in the initial waves of attacks to paralyze base operations, kicking the door down for follow-on cruise missile strikes. To maximize their effects, the missiles could be dedicated to targets that are particularly difficult to replace or repair quickly.

Open-source references do not provide sufficient data about the precise size of the DF-21C force or the growth trajectory of the arsenal. If the MRBM inventory remains relatively unchanged, then it can be inferred that the PLA intends to concentrate the missiles against a few bases at the outset of a campaign. If, however, the Second Artillery fields a sizable DF-21C missile force in the coming years, then the PLA may be preparing for a larger-scale undertaking involving more bases across Japan. Whether China will build substantially more MRBMs, which are not cheap, depends on calculations of cost, potential opportunity costs, and alternative strike options. Other methods for delivering precision firepower, including land-attack cruise missile raids launched from bombers, could become a more prominent component of China’s missile strategy, one that would still pose a major threat to U.S. bases in Japan.

China’s Missile Strategy

The Second Artillery’s family of theater strike systems is at the heart of Beijing’s strategy to deter U.S. and allied intervention over such potential flashpoints as a cross-strait conflagration. For a high-intensity conventional military campaign to obtain its maximum effectiveness, the PLA would need to inflict substantial damage to Japanese and American airfields and naval facilities that are critical to allied air superiority and sea control, the operational prerequisites for thwarting Chinese war aims. As such, missile salvos designed to degrade or disable Kadena, Yokota, Misawa, Iwakuni, Yokosuka, and Sasebo naval base would aid substantially the PLA's opening moves.[20] The missiles would disrupt the use of bases by military units already deployed there while barring U.S. reinforcements from other locations to those bases. China would, in effect, erect a contested zone across large parts of maritime Asia, severely hampering allied freedom of movement.

These missiles could be employed against major air and naval bases across the Japanese archipelago. At airbases, missiles could attack runways, hangars, maintenance shops,

ammunition storage sites, and command and control centers. Aircraft parked in the open would be exposed to destruction on the ground.[21] Chinese ballistic and cruise missiles could be launched against fuel storage tanks, ammunition depots, dry docks, machine shops, and pier-side facilities located at major naval bases. Warships and supply vessels fixed at their berths would be at risk while ships undergoing overhaul in dry docks would be easy targets. Civilian and military personnel, including shipyard workers and ground crews critical to the proper functioning of the bases, could suffer casualties in a missile raid. A concerted Chinese missile campaign could thus deliver a major blow to the logistical foundations of Japanese forces and of U.S. forward presence in Asia. By disrupting the supply system and degrading repair capabilities, Beijing aims to choke off the allied capacity to conduct combat operations.

While successful attacks on bases in Japan would by no means constitute a war winner for Beijing, they almost certainly would complicate U.S. war planning while magnifying the tyranny of distance inherent to air and fleet operations in the vast Pacific. At the very least, doing great harm to the region's basing infrastructure at the outset of conflict could help the PLA slow down or hold at bay U.S. and allied forces operating along the approaches to the Chinese mainland. An effective suppression campaign against naval and air bases could preclude a quick allied response to China’s first military moves, degrade the capacity to contest Chinese use of the air and the sea, disrupt the flow of U.S. reinforcements into the combat theater, and drive up the cost of sustaining follow-on operations.

Conversely, this potential vulnerability underscores the centrality of Japanese bases to the U.S. strategy in Asia. Take Yokosuka, for example. It is the only facility west of Hawaii that possesses the wherewithal to handle major carrier repairs. This base is also an indispensable forward logistical hub without which U.S. naval units would be forced to rely on a far more time-consuming supply chain located in Guam, Hawaii, San Diego, and Singapore. Yokosuka's strategic location, physical infrastructure, world-class facilities, and highly-skilled local work force are virtually impossible to replicate anywhere else in Asia. Similarly, without Kadena and other forward air bases in Japan, U.S. aircraft would likely have to fall back to Andersen Air Force Base in Guam, almost 2,300 kilometers to the southeast of Okinawa. From such a distance, the U.S. Air Force would have to generate a potentially unsustainable number of sorties, including tankers to refuel inbound and outbound fighters, just to match the combat power that Kadena can bring to bear in theater.

But this is not just a problem for the United States. Chinese missiles could also threaten bases used exclusively by Japanese forces. Units from the Air and Maritime Self-Defense Forces (ASDF and MSDF respectively) use Naha International Airport in Okinawa, which is theoretically within range of China’s DF-16 missile. The MSDF’s P-3C aircraft and the ASDF’s F-15 fighters operate from there. These aircraft, especially those parked in the open or in unhardened shelters, would be highly vulnerable to a PLA missile raid. Indeed, they could be destroyed on the ground before ever having the chance to launch their first sorties. Chinese missile barrages also could cut Naha’s single runway, precluding aircraft from taking to the air, at least during the initial stages of a conflict. Bases in Kyushu, including the MSDF’s Kanoya airbase and the ASDF’s Nyutabaru airbase and Tsuiki airfield, would also be within range of Chinese medium-range ballistic missiles.

The MSDF's main naval bases are Ominato, Yokosuka, Kure, Sasebo, and Maizuru. Notably, Sasebo is notionally within striking distance of the DF-16, if reports of its 1,000-kilometer range are accurate. Meanwhile, China could target Japan's capital ships that are in port or underway. The MSDF has invested in ever-larger helicopter carriers, including the *Hyuga* and the *Izumo*, to boost its capacity to sustain rotary-wing anti-submarine warfare operations. Such high-value ships could be enticing to the PLA, and they would be easy targets if a Chinese missile raid catches them in port and at pier-side. In addition, China's anti-ship ballistic missiles (ASBM) could potentially target these higher-signature vessels.[22] As former fleet commander of the MSDF, Admiral Makoto Yamazaki, warned, "If the ASBMs are simply programmed to track large ships, then the large 22DDH [the *Hyuga* helicopter carrier] would be an attractive target second only to the U.S. aircraft carrier in the Japan-U.S. fleet conducting joint operations."[23] Another former fleet commander, Admiral Mutsuyoshi Gomi, expressed similar concerns.[24]

Implications for the U.S.-Japan Alliance

To cope with China's missiles, the U.S.-Japan alliance should: 1) bolster the wherewithal to absorb punishment; 2) make the most of Japan's superb civilian infrastructure and unique maritime geography; 3) defend actively against ballistic and cruise missile threats; and 4) improve allied operations in peacetime. The operational goals are to impose more costs on China's offensive strategy, deny China's bid to seize the initiative with a rapid first move, increase the likelihood of stalemate, buy time for the United States to rush reinforcements to Japan, and improve the allied capacity to restore command of the Asian commons. Ultimately, the objective is to cast greater doubt on the efficacy of a Chinese missile campaign, thus disinclining China to act in the first place.

Resilience is central to allied strategy. Accordingly, Japan is turning to the mundane, but no less important, task of shoring up the basing infrastructure across the Japanese islands. For example, hardening important facilities and expanding underground storage sites would strengthen Japan's capacity to withstand Chinese missile strikes. The ability to repair infrastructure damage rapidly, such as cut runways, following missile attacks also would enable the U.S.-Japan alliance to recover from China's first blow and sustain subsequent military operations. Notably, the 2013 National Defense Program Guidelines direct the Self-Defense Force (SDF) to "improve survivability, including the recovery capabilities of military camps and bases."[25] The allied capacity to endure punishing bombardment would go far to deny Beijing the quick, decisive victory that it evidently believes is possible with an overwhelming missile strike.

Japan is also diversifying the risk to its bases. At present, the concentration of allied assets in a few locations substantially simplifies Chinese targeting. The PLA only needs to throw the weight of its missile barrages against a handful of large bases across Japan to achieve its anti-access aims. To balk China's strategy, alternate airfields and ports could be made available to U.S. and Japanese forces. The 2013 NDPG pledges to "undertake necessary deliberations concerning civilian airports and ports…in order to ensure that such facilities can be used as part of the operational infrastructure of the SDF."[26] This is a promising start.

Civilian airports, commercial shipyards, and piers across Japan could be conscripted for use in wartime. More than 100 airports of varying sizes are located across the Japanese islands. In addition to Kansai and Narita International Airports with 4,000-meter runways, more than a dozen international and regional airports have runways that are at least 3,000 meters long. The latter includes Fukuoka, Kagoshima, Kumamoto, and Nagasaki airports in Kyushu located near the East China Sea, a likely area of intense air and naval combat should a conflict break out with China. Many others spread across the archipelago have runway lengths between 2,000 to 2,500 meters. In Tokyo Bay alone, 31 civilian ports dot its 180-kilometer coastline, including such major ports as Tokyo, Chiba, Yokohama, Kawasaki, Yokohama, and Kisarazu.

With sufficient early warning, allied air units could disperse to these airfields while naval vessels could sortie out to sea, diluting China's confidence that it can disrupt enemy operations in a single blow against a few bases. If their home bases are disabled or temporarily unavailable in a conflict, U.S. and Japanese forces could fall back on these sites to refuel, rearm, undergo repairs, and permit crew rest. Flexible access to a larger number of widely distributed airfields and ports across the Japanese islands would help allied forces survive, recover, and regroup after the first waves of Chinese attacks. The alliance would thus be in a much better position to wrest the initiative from China and retake command of the commons in subsequent phases of the war. Such a posture would also pose a serious challenge to the PLA. The potential costs of committing a finite number of missiles to a multiplying set of targets would likely be prohibitive. Moreover, the burden on China to keep track of enemy whereabouts would mount, thus stressing its intelligence, surveillance, and reconnaissance assets while adding to the fog of war. The more friction and uncertainty the alliance can impose on China, the better.

In addition to building resilience into the basing infrastructure, Japan could deploy counterforce weaponry on the Ryukyu Islands to impose additional costs on the PLA's missile force. In crisis or wartime, Tokyo could position truck-mounted anti-ship and anti-air missile units across the southern archipelago to erect a formidable barrier against China's air and naval forces. Able to "shoot and scoot," Japan's mobile platforms can disperse and move by night or under cover to escape Chinese counterstrikes. Tunnels, hardened shelters, disguised storage sites, and decoys on the Ryukyus would further undermine the PLA's capacity to identify, target, and destroy missile units.

If PLA commanders could be coaxed into nullifying these Japanese defenders, then the effects would be similar to those of the dispersal strategy described above. Any Chinese attempt to eliminate Japan's elusive missile batteries would require the PLA to open a geographic front about 1,000 kilometers wide. Moreover, a Chinese suppression campaign involving air power and ballistic- and cruise-missile strikes would accelerate the rate at which the PLA consumed finite stocks of munitions, airframes, and airmen. Such exertions, however, likely would prove disappointing, à la coalition forces' fruitless "SCUD hunt" during the first Gulf War while tying down portions of China's warfighting capacity. Conversely, Japan could absorb the losses of inexpensive missile-firing platforms. Such tactical costs would be especially worthwhile if, in the process of neutralizing Japanese defenders, China's military suffered its own attrition in ships sunk, aircraft downed, and missiles fired.

Active defenses to counter the missile threat, a centerpiece of U.S.-Japan technical cooperation, will remain relevant in this contest. Land- and sea-based ballistic missile defense systems, including American and Japanese *Aegis*-equipped destroyers and the Patriot Advanced Capability-3 (PAC-3) batteries deployed around key sites in Japan, are poised to track and intercept ballistic missiles. According to the latest Mid-Term Defense Program, Japan's maritime service will add two more to its fleet of four *Kongo*-class and two *Atago*-class destroyers while Patriot units will be upgraded with new interceptors to better defend against aircraft and cruise missiles.[27] While ballistic and cruise missile defenses would by no means immunize Japan from the voluminous firepower that the PLA is expected to unleash, a stout defensive effort would likely stiffen Japanese resolve to resist Chinese coercion. Ensuring that some proportion of China's missiles does not get through would further drive up the costs of an offensive strategy.

Finally, in peacetime, Japan and the United States must develop their capacity to survive, recover, and reengage enemy forces following a missile attack to shape China's risk-benefit calculus. Adequate investments in hardening existing facilities and in active defenses, including advanced air defense systems against cruise missiles and aircraft, would be an important first step. Periodically rotating forces through civilian airfields and ports would test the feasibility of dispersal. Japan could also dispatch missile-armed batteries to the Ryukyus on a regular basis or station a permanent, but limited, presence on the islands. Such visible rehearsals would sharpen tactical skills and strengthen allied coordination while demonstrating to Beijing the potential futility of an easy win and the likely risks of a protracted contest. Keeping China on notice would do much to shore up deterrence.

It is worth noting that these responses, individually or collectively, to China's missile threat do not constitute a silver bullet. At best, Tokyo forces a stalemate with Beijing by diminishing, to the extent possible, the effects of Chinese missile raids. Nevertheless, deadlock may buy enough time for the U.S.-Japan alliance to recover from the initial shock of battle and for American forces to rush reinforcements into the combat theater. Follow-on operations would be required for U.S. and Japanese forces to roll back any operational gains the PLA may have made in the initial phases of a conflict. Resilience is but the first step in an iterative and interactive contest.

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[1] Ian Easton, *China's Evolving Reconnaissance Strike Capabilities: Implications for the U.S.-Japan Alliance* (Arlington, VA: Project 2049 Institute, February 2014), p. 18.
[2] The U.S. personnel numbers are based on figures provided by *U.S. Forces Japan: Official Military Website*, www.usfj.mil/.
[3] See http://www.kadena.af.mil/main/welcome.asp.
[4] Liu Zhipeng, et al., "Communications Electronic Warfare Currently Facing the Chinese Navy and Research on Countermeasures," *Information and Communications*, No. 2 (2013), pp. 197-198.
[5] Wang Weiwei, "The Logic of Alliance Hegemony: Understanding U.S. Behavior in the Sino-Japanese Contest," *Northeast Asia Forum*, No. 2 (2014), p. 94.
[6] Ou Yangwei, *On Strategic Deployment* (Beijing: Liberation Army Press, 2011), p. 38.
[7] Liu Yonghui, *Foreign Aircraft Carrier Operational Command* (Beijing: Military Science Press, 2007), pp. 323–24.
[8] The term "powerful enemy" is usually code for the United States. Yu Jixun, ed., *The Science of Second Artillery Campaigns* (Beijing: Liberation Army Press, 2004), p. 401.
[9] Shou Xiaosong, ed., *The Science of Military Strategy* (Beijing: Military Science Press, 2013), p. 236.
[10] Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (Arlington, VA: Department of Defense, 2014), p. 40.
[11] Ibid., p. 31.

[12] National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat* (Wright-Patterson Air Force Base, OH, July 2013), p. 14.
[13] Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (Arlington, VA: Department of Defense, 2011), p. 78 and NASIC, 2013, p. 17.
[14] Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (Arlington, VA: Department of Defense, 2012), p. 29.
[15] U.S. official classification of the DF-16 missile varies. In testimony to the U.S. Senate Armed Services Committee, the Director of the Defense Intelligence Agency, Lieutenant General Vincent Stewart, described the DF-16 as a medium-range ballistic missile. According to the Pentagon and NASIC, an MRBM's minimum range is 1,000 kilometers. NASIC, by contrast, classifies the DF-16 as a short-range ballistic missile with an estimated range of at least 800 kilometers. See Lieutenant General Vincent R. Stewart, Director, Defense Intelligence Agency, "Worldwide Threat Assessment," Statement before Senate Armed Services Committee, United States Senate, Washington, D.C., February 26, 2015, pp. 11-12 and NASIC, *Ballistic and Cruise Missile Threat*, 2013, pp. 10 and 14.
[16] For an analysis of how land-attack cruise missiles might be employed against Taiwan, see Dennis M. Gormley, Andrew S. Erickson, and Jongdong Yuan, *A Low-Visibility Force Multiplier: Assessing China's Cruise Missile Ambitions* (Washington, D.C.: NDU Press, April 2014), pp. 79-82.
[17] Qiao Jie, *The Science of Campaigns Course Material* (Beijing: Military Science Press, 2012), pp. 226-231.
[18] Shou Xiaosong, ed., *The Science of Military Strategy*, p. 236.
[19] For an open-source estimate of the number of DF-21Cs, see Jon Solomon, "The Chinese DF-21 Arsenal: An Open Source Assessment of What its Fielded Composition Says About its Likely Doctrinal Roles, Parts 1-4," *Information Dissemination*, November 10-13, 2014. Solomon calculates that the Second Artillery could possess a maximum of 40 DF-21C missiles.
[20] Toshi Yoshihara, "Japanese Bases and Chinese Missiles," in Carnes Lord and Andrew S. Erickson, eds., *Rebalancing U.S. Forces: Basing and Forward Presence in the Asia-Pacific* (Annapolis, MD: Naval Institute Press, 2014), pp. 37-65.
[21] In the context of attacks against airbases in Taiwan, see David A. Shlapak, et. al., *A Question of Balance: Political Context and Military Aspects of the China-Taiwan Dispute* (Santa Monica, CA: RAND, 2009), pp. 31-51.
[22] For an excellent overview of ASBM development, see Andrew Erickson, *Chinese Anti-Ship Ballistic Missile (ASBM) Development: Drivers, Trajectories and Strategic Implications* (Washington, D.C.: Jamestown Foundation, 2013).
[23] Makoto Yamazaki, "Thoughts about Eye-Catching 22DDH," *Ships of the World*, (September 2009), p. 105.
[24] Mutsuyoshi Gomi, "The Development of China's Naval Power," *Japan Military Review*, (May 2013), p. 164.
[25] Japan Ministry of Defense, National Defense Program Guidelines for FY 2014 and beyond, December 17, 2013, p. 24.
[26] Ibid., p. 25.
[27] Japan Ministry of Defense, Mid-Term Defense Program, (FY2014-2018), December 17, 2013, pp. 11 and 33.