

# THE ARSENAL OF DEMOCRACY

TECHNOLOGY, INDUSTRY, AND DETERRENCE  
IN AN AGE OF HARD CHOICES



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# SURVEILLANCE AND RECONNAISSANCE

Scouting—the task of finding and tracking the enemy, also known as reconnaissance—is essential in all air-naval combat and carries unique importance in the Indo-Pacific theater. Unlike land forces, which can often shield themselves with terrain, naval units operate across vast open seas where detection can lead swiftly to engagement. Historically, scouting’s value was primarily strategic. Scouting helped fleets locate one another and decide when and how battles began. Once a battle began, scouting had relatively little impact on tactics. Since the early twentieth century, however, advances in naval technology have transformed scouting into a tactical imperative. Today, in the Indo-Pacific, missiles can strike accurately from hundreds of kilometers away, requiring naval units not only to avoid detection but also to spot and track the enemy’s movement from far beyond visual range.

This chapter examines the historical development of scouting and counter-scouting, showing how technological shifts have influenced the strategic, operational, and tactical dimensions of warfare. Cold War history, in particular, highlights how these capabilities contribute to deterrence, not just combat effectiveness. The latter half of the chapter addresses the specific scouting challenges facing the United States in the Indo-Pacific and the key relevant technologies,

particularly unmanned aerial systems (UAS) and reconnaissance and communications satellites.

The chapter recommends a three-pronged approach to strengthen US scouting and counter-scouting capabilities. First, the United States should invest in resilient, affordable, and scalable scouting assets, such as UAS and small satellites, building a large and versatile network of intelligence, surveillance, and reconnaissance (ISR) assets that can withstand attrition. Second, the United States must redouble its investments in counter-scouting techniques such as electronic warfare (EW), stealth, and decoys. In thinking about how to do this and demonstrate its capabilities to China for strategic effect, it can draw inspiration from the Haystack and UPTIDE programs during the Cold War.<sup>1</sup> Finally, to ensure reliable communications across this vast scouting network, the United States should develop alternative communication systems, such as undersea and line-of-sight links, to maintain essential connectivity in the region even if its primary satellites are compromised.

## **Scouting and Range in Naval Warfare**

Scouting differs significantly from land and naval warfare.<sup>2</sup> On land, military units typically operate in relatively close formations, using terrain for concealment. Reconnaissance in naval warfare is crucial for two main reasons: the inherent visibility of naval assets and their extensive operational dispersion. Surface ships, being large and few in number, stand out sharply against the ocean—but they can also spread out across vast areas, making them paradoxically both more visible and harder to locate.<sup>3</sup> This dual challenge has made reconnaissance increasingly vital as weapons ranges have extended, fundamentally shaping both strategic planning and tactical execution in naval combat. Despite modern trends toward more distributed land forces, this basic distinction persists.<sup>4</sup>

Before the early twentieth century, naval scouting was important, but it mattered only indirectly to combat performance. Warships were slow-moving craft and they could not spot enemy ships (or communicate

with friendly ones) from beyond visual range. Until the advent of steam power, ships were also restricted in their speed and direction by wind. During the Age of Sail, the “Weather Gauge” was an essential tool: by taking a position upwind of the enemy, one commander could gain more maneuver options.<sup>5</sup> Before the advent of cannons that could reliably hit targets at 10 to 15 kilometers, warships fielded short-range muzzle-loading cannons, which could fire only a few hundred meters. The first breech-loading modern naval guns were limited to around 1,000 meters.<sup>6</sup> The inability to launch attacks from long ranges limited the tactical advantage of spotting the enemy first. Assuming weather conditions allowed for visibility, combatants could see each other for some time before engaging. Still, scouting was helpful during the Age of Sail for positioning oneself so that engagements began at a favorable moment and with favorable wind position. The major powers all invested resources in naval scouting, using small, light warships to monitor maritime traffic along the key sea lines of communication.

Vice-Admiral Horatio Nelson’s two greatest victories, at Aboukir Bay in 1798 and Trafalgar in 1805, exemplify the indirect relationship between scouting and tactical victory during the Age of Sail. At Aboukir Bay, Nelson attacked a French fleet that had taken up a defensive position at anchor.<sup>7</sup> Nelson won not because he had superior knowledge of the French position but because he applied his combat power to the French fleet in sections, winning through hours of brutal close-quarters combat. At Trafalgar, Nelson’s scouting superiority helped him find and attack the Franco-Spanish Fleet, which he had sought to bring to battle for months. But once the two fleets spotted each other, it took hours for Nelson and his opponent, the French Admiral Pierre-Charles de Villeneuve, to assemble their forces and engage.<sup>8</sup> During this period, scouting had a strategic effect: It shaped the way navies approached engagements with one another. Its tactical value in particular battles was less clear.

The advent of long-range gunnery and high-speed coal and oil-powered warships in the early twentieth century made scouting essential for tactical victory for the first time. With superior knowledge

of enemy positions, the fleet with a scouting advantage could now position itself to land a crippling surprise punch, creating a lopsided force ratio for the rest of the engagement. In this era, the sheer vastness of the ocean made forcing a naval engagement a priority task, since ships could more easily slip away from contact.<sup>9</sup> At Tsushima in 1905, the Imperial Japanese fleet, commanded by Admiral Tōgō Heihachirō, was able to force an engagement with a Russian fleet that had traveled from European bases for months, falling on the enemy at precisely the right moment to give his forces a decisive advantage.<sup>10</sup> By the time of the Battle of Jutland in 1916, the United Kingdom and Germany were devoting around one-fifth of their big-gun fleets to scouting.<sup>11</sup> German Admiral Reinhard Scheer, knowing that Admiral Sir John Jellicoe's British Grand Fleet outnumbered his, sought to identify the British and attack a section of the British fleet before it could assemble for battle. The British and German scouting forces engaged in a fast-paced fight for the battle's initial hours, feeling out adversary positions. Jutland demonstrated a basic principle of naval combat: that whichever side "attacks effectively first" enjoys a distinct advantage.<sup>12</sup>

As ships gained the ability to shoot at each other from longer ranges, it also became increasingly important—and technically challenging—to maintain constant, secure *communications* between scouts and shooters. At Jutland, Admiral David Beatty's battlecruiser force had poor communication links with the Grand Fleet's battleship line. As a result, Jellicoe did not know the direction and disposition of the German High Seas Fleet. By sheer luck, Jellicoe turned his fleet to the east in a battle line just as the Germans emerged from a thick fog. The High Seas Fleet barreled into the Grand Fleet's organized battle line with devastating results. After taking a brutal beating, Scheer broke contact and sought to slip away overnight. He succeeded, despite several close calls, because British destroyer pickets were not coordinated enough for nighttime scouting. If the British had had better communications, they might have converted their scouting advantage into a decisive tactical victory, crippling the German High

Seas Fleet, rather than a strategic victory but tactical stalemate that left the High Seas Fleet damaged but intact.

The rise of naval aviation in the 1930s extended naval combat ranges from 10 to 30 kilometers to hundreds of kilometers, making scouting even more important.<sup>13</sup> Between aircraft carriers and catapult-launched scout planes, enemy fleets could now engage from well beyond visual range. Geographic arithmetic made scouting particularly relevant in the Pacific. A hostile fleet could now launch attacks from anywhere across thousands of square kilometers of open ocean. Thus, even as the firepower of individual ships expanded with longer-range battleship guns, more powerful bombs, and torpedoes, commanders continued to devote scarce resources to scouting. Major navies developed scout dive bombers, ground-based reconnaissance aircraft, and seaplanes to find the enemy.<sup>14</sup> At Pearl Harbor, the Japanese carrier fleet penetrated a porous US scouting system, launching multiple strike waves against the US fleet at anchor before ground-based aviation could respond.<sup>15</sup> At Midway, as we have seen, superior scouting enabled the US force to deliver a counterblow. Thanks to a combination of technical intelligence (code breaking) to identify Japanese plans and a scout bomber fleet, the US side identified the Japanese carriers first and quickly sank all four of Japan's fleet carriers in the battle. Only one American carrier sunk.

The Battle of Savo Island illustrates what can happen in modern naval warfare when both sides have scouting limitations.<sup>16</sup> A Japanese cruiser force sought to attack the US and Australian transports off the strategically crucial island of Guadalcanal, aiming to isolate the Allied landing force. Although US scouts had identified the incoming Japanese task force, poor communications, inadequate scouting patterns, and the preemptive withdrawal of US carrier air cover left a numerically superior Anglo-American force largely fighting blind. Exploiting Allied confusion, the Japanese launched a surprise night attack. They sank four Allied cruisers and inflicted over a thousand casualties, while incurring minimal losses. However, Vice Admiral Gunichi Mikawa, the Japanese task force commander, feared that

Allied carriers might destroy his fleet if they spotted it by daylight. He withdrew overnight, missing an opportunity to strike the Allied transports. The Allied carriers also withdrew to safety. Although Mikawa failed to prevent the Allies from securing Henderson Field, the battle underscored the critical link between scouting and naval combat success. When neither side enjoys a scouting advantage, air-naval warfare can devolve into chaotic encounter battles, where individual firepower predominates. The United States would like to avoid such a situation in any future air-naval war against China, given China's likely geographic advantages and access to larger volumes of munitions.

The rise of communications satellites in the 1970s and 1980s transformed scouting once again and made it even more important. In the Age of Sail, ships used flags to communicate basic messages, and the most modern navies created a signal flag system to send messages between ships. These techniques required good weather and were relatively slow. They also restricted ships to maneuvering in one long column, limiting tactical options.<sup>17</sup> The advent of radio communications in the early twentieth century made possible real-time communication with scouts, but poor coordination between individual scouts and the central combat system often created gaps in the network.<sup>18</sup> The advent of secure satellite communications made it possible for the US scouts to communicate targeting instructions to shooters anywhere in the world. These technologies were perfected in the Global War on Terror, as US forces regularly struck precise targets from thousands of kilometers away. Satellite communications will be essential for US scouting in any air-naval conflict in the Indo-Pacific. That fact, as we will see later in this book, makes the US satellite network a potential target.

## **Counter-Scouting**

Given the strategic and tactical importance of scouting, counter-scouting to disrupt the enemy's scouting network is vital. In practice,

effective counter-scouting often relies on identifying enemy scouts and understanding their positions, so scouting and counter-scouting are highly interdependent. Techniques for counter-scouting in air-naval warfare run across domains. They include EW, decoys, cyber, and stealth tactics. Gaining an advantage in counter-scouting can significantly bolster strategic deterrence.<sup>19</sup>

The most notable examples of counter-scouting as strategy come from the Cold War, when the US and Soviet navies' scouting/counter-scouting struggle shaped the European strategic balance.<sup>20</sup> As discussed in chapter 1, for most of the Cold War, the Soviet and Warsaw Pact land forces arrayed along the inner German border and farther east could have quickly overwhelmed their NATO adversaries. However, after an initial invasion of Western Europe, second- and third-echelon Soviet forces would have needed to transit thousands of kilometers to reach the front line. If US air-naval forces were properly positioned in the Mediterranean, they could have attacked Soviet forces in their assembly areas, buying time to airlift US forces across the Atlantic and prepare a counterattack.<sup>21</sup> According to this logic, US carrier battle groups in the Mediterranean and High North (the Arctic seas off northern Europe) were critical to deterring a Soviet attack. If necessary, these ships would serve as the primary launch points for strikes against Soviet logistics. The US Navy, however, faced a robust Soviet scouting and air defense network that included land-based patrol aircraft, point defense batteries, anti-ship missiles, surface combatants, and submarines.<sup>22</sup> Unless they could evade the Soviet scouts and get close enough to deliver their strikes, US deterrence in Europe would fall apart.

The US response was the Haystack and UPTIDE programs, a series of exercises designed to improve the Navy's ability to evade Soviet detection and launch strikes against advancing Soviet forces.<sup>23</sup> Both programs involved the development of a number of decoys, jammers, and emissions control techniques to prevent Soviet scouts—aircraft, ships, and radars—from finding US ships. They also involved new tactics for distributing ships in the fleet and penetrating Soviet air defenses.

By the end of Haystack and UPTIDE in the late 1960s, the US Navy had extended its detection evasion time from two hours to fifteen.<sup>24</sup> By the early 1980s, the United States could have launched multiple strike waves against Soviet forces before being spotted and neutralized.

In the North Atlantic, US counter-scouting efforts proved even more strategically significant for deterrence. For most of the early Cold War, US planners feared that Soviet war plans involved surging submarines from bases in the High North to hold the United States' eastern coast at risk and threaten supply lines between Europe and North America.<sup>25</sup> But over time, as US counter-scouting techniques improved, the Soviets became more concerned about protecting the nuclear-armed submarines that carried their nuclear second strike. The Soviets created two major submarine "bastions"—marginal seas from which their nuclear-armed ballistic missile submarines could operate under the protection of land-based strike aircraft and surface warships. By the late 1970s, the US Navy was on the offensive. Rather than defending the Greenland-Iceland-UK Gap against the possibility that Soviet submarines might try to slip into the North Atlantic, it began to signal that it might be able to send its own ships and subs into the Arctic to threaten Soviet bastions, pressuring Moscow's nuclear deterrent.<sup>26</sup> The Americans' ability to do this depended on developing ships that could evade Soviet scouts and get close enough to strike their targets off Russia's Arctic coast.

By the 1980s, advances in satellite communications, emissions control, and radar masking had significantly enhanced US carrier battle groups' ability to operate while minimizing detection.<sup>27</sup> Through exercises like Ocean Venture 1981–82 in the Norwegian Sea, the US Navy demonstrated its growing capability to penetrate Soviet ocean surveillance systems and challenge Soviet naval forces near their home waters.<sup>28</sup> Although NATO forces had not achieved overall conventional superiority in Europe, improvements in allied air-ground coordination and precision strike capabilities contributed to Moscow's concerns about the shifting military balance. The cumulative effect of these operational and technological developments was to reduce the

effectiveness of specific Soviet defensive investments, particularly in air defense and ocean surveillance systems developed since the 1960s.<sup>29</sup> Internal Soviet military assessments from 1985–86 warned that countering improved US capabilities would require big new investments in Arctic defense systems.<sup>30</sup> This growing technological gap emerged as one of several factors influencing Soviet strategic calculations under General Secretary Mikhail Gorbachev. While pursuing reform of the Soviet economy, Gorbachev sought arms control agreements partly to constrain the pace of US military modernization.<sup>31</sup> However, neither arms control nor economic reform resolved the Soviet Union's underlying structural challenges or eliminated its sense of insecurity about the US military's growing offensive capabilities.<sup>32</sup>

The United States has a long way to go before it can create a similar dynamic with China, but the same principle holds. The United States and China today are engaged in a renewed competition to penetrate and disrupt each other's scouting networks. The United States seeks to create gaps in China's scouting network that its long-range missiles, stealth aircraft, and submarines can exploit, just as Haystack and UPTIDE penetrated Soviet scouting.<sup>33</sup> China, meanwhile, hopes to scout the battlespace around Taiwan effectively enough that US scouting (and strike) assets have to stay far back from the First Island Chain, limiting their usefulness.<sup>34</sup> The lesson of history is that whichever side wins this contest could seize strategic as well as tactical benefits.

China's scouting network—which Soviet doctrine terms its reconnaissance-strike complex (RSC)—currently extends roughly to the First Island Chain and in some parts beyond it. With Taiwan so close to the mainland coast, China's RSC also reaches deep into the Philippine Sea on Taiwan's eastern side. Leveraging a vast array of more than 490 intelligence, surveillance, and reconnaissance (ISR) satellites equipped with optical, multispectral, radar, and radio frequency sensors, China can track US assets across the region. When combined with the PLA's strong long-range precision strike capabilities, US assets in the First Island Chain have become increasingly vulnerable to detection and targeting.<sup>35</sup>

For the United States to credibly threaten to defeat an invasion of Taiwan, it must demonstrate the ability to penetrate and operate within China's RSC.<sup>36</sup> US air-naval power should ideally be based outside China's RSC but be capable of operating within it for hours at a time before withdrawing. US land-based assets such as Marine Littoral Regiments based out of Japan will need to operate within China's RSC. According to the Marines' Force Design 2030 reorganization plan, "The reach of modern stand-off weapons like hypersonic glide vehicles and associated targeting systems [is] so great that Marines will constantly operate under threat rings of these systems; they will not be guaranteed freedom of movement without the enemy's cognizance."<sup>37</sup> In other words, scouting and counter-scouting will be essential to both deterrence and warfighting.

The good news is that owing to the range of key US strike assets, the PLA will struggle to win a Taiwan war if US assets can operate within roughly 600 to 1,000 kilometers of China's coastline. For context, Taiwan lies approximately 160 kilometers from mainland China's coast, placing it well within this operation zone. As we will explore in more detail in chapter 3, variants of the JASSM/LRASM missiles have ranges from 370 to 1,000 kilometers, while the Block IV and V Tomahawk Land Attack Missile (TLAM) can exceed 1,000 kilometers.<sup>38</sup> Most US carrier-based strike aircraft have an effective range of 500 to 900 kilometers, with the F-35 reaching up to 1,000 kilometers on internal fuel. In practice, however, weapon ranges are often shorter than theoretical maximums, and many operational details are classified or uncertain.

Given these strike ranges of US assets, the difference between China's RSC extending 600 kilometers versus 1,000 kilometers could be very significant. If China's RSC only extends 600 kilometers, US missile-armed warships and fixed-wing aircraft could potentially target PLA forces around Taiwan and even strike strategic targets on the Chinese mainland. If China's RSC extends toward 1,000 kilometers, however, US forces would need to take more risks and use longer-range munitions to deliver effective strikes. Thus, given the substantial risks of a conflict with the United States, the PLA will likely want its RSC to

extend at least 1,000 kilometers before it considers instigating a war over Taiwan.

If conflict expands to outer space, Washington might cut off China's access to GPS or even dazzle or destroy China's reconnaissance satellites.<sup>39</sup> American aircraft and warships can use classified stealth techniques to disappear into the ocean's vastness, and the United States can use dummies and other techniques to complicate the PLA's scouting cycle. Although the PLA has developed an enormous missile arsenal, if it cannot identify and attack US warships and aircraft, the US RSC would win in a direct confrontation.

This discussion highlights a major risk: that the reconnaissance and communications satellites that form the foundation of the US scouting complex will become targets. China and Russia are actively building an array of capabilities to place US space assets at risk.<sup>40</sup> Maintaining the US scouting advantage will therefore require demonstrating that US space-based networks are more resilient than China's. The United States can also build and covertly display other capabilities that deter China from escalating in the space domain. We will return to these issues in chapter 9.

## **The Role of Unmanned Aerial Systems**

The United States and China both need scouting networks that comprise satellites, drones, manned aircraft, and other sensors beyond the range of most long-range weapons in the adversary's arsenal, alongside cheaper, more expendable, or hardened systems within adversary strike range. The various elements of these networks present trade-offs among range, payload, and cost.<sup>41</sup> In Ukraine, both the Ukrainian and Russian armed forces can rely on short-range UAS for tactical and even operational reconnaissance. This is possible because the two adversaries are fighting over a land border. In the Indo-Pacific, by contrast, scouting platforms need ranges of hundreds or thousands of kilometers to work effectively.<sup>42</sup> Both sides would need to identify and track enormous

numbers of targets persistently and over a much larger space. Cost is therefore a crucial variable, given the possibility of attrition. In essence, each side wants to create large numbers of scouting assets that are individually powerful but cheap to build and easy to replace.<sup>43</sup> Small satellites in low-earth orbit (LEO) pass this test, but satellites cannot compete with UAS in operational flexibility and affordability.

The United States and its allies must start building long-range scouting UAS in vastly greater numbers. In Ukraine, the United States has operated RQ-4 and MQ-9 reconnaissance UAS over the Black Sea to help Ukraine target Russian positions.<sup>44</sup> However, apart from one Russian aircraft that crashed into an MQ-9—probably by mistake—these assets have faced effectively no attrition. Russia has been deterred from striking US assets directly.<sup>45</sup> In a Sino-American War, both sides' scouting UAS would likely suffer high attrition, since they would have to venture close to the other side's counter-UAS (CUAS) systems. Here it becomes a big problem that the United States uses the same scouting platforms for offense and defense and often bundles scouting platforms with other capabilities. For example, the P-8 maritime patrol aircraft is the US Navy's premier manned scouting tool. But its primary role is to counter enemy submarines and thereby to protect aircraft carriers and sea lines of communication.<sup>46</sup> The US Navy has 130 P-8s, which will grow to around 150 in the coming years. However, it may need to hold most of them back from the Chinese RSC to protect aircraft carriers and other high-value US assets, rather than pushing them forward to scout.<sup>47</sup> At \$174 million apiece, P-8s are expensive aircraft to lose. Some US surface combatants can technically be used for scouting, but they would be much more valuable if used for other combat functions.<sup>48</sup>

China has gotten the memo and is quickly building a formidable fleet of cheap, disposable, high-capability scouting UAS (see table 2.1).<sup>49</sup> The PLA has several hundred medium-altitude, long-endurance (MALE) and high-altitude, long-endurance (HALE) UAS like the BZK-005 and the Wing Loong series, operating from dozens of bases within a few hundred kilometers of potential conflict zones, and these

**Table 2.1** Specifications of four major US and PRC medium-altitude long-endurance (MALE) drone types. Payload indicates what each system can carry, including munitions and additional sensors.

| Model                                                    | Range         | Payload                                             | Cost                                                 |
|----------------------------------------------------------|---------------|-----------------------------------------------------|------------------------------------------------------|
| Wing Loong<br>(Data based on Wing Loong 3, latest model) | 10,000 km (a) | 2,300 kg (b)                                        | \$1–\$2 million (c)<br>(based on Wing Loong 2 price) |
| CASC Rainbow                                             | 10,000 km (d) | 1,000 kg (d)                                        | \$1–\$2 million (c)<br>(based on CH-4 price)         |
| MQ-9 Reaper                                              | 1,900 km (e)  | 1,700 kg                                            | \$16 million (c)                                     |
| MQ-4C Triton<br>(RQ-4 Global Hawk)                       | 15,200 km (f) | N/A (MQ-4C lacks hardpoints for additional sensors) | \$200–\$600 million (g)                              |

Sources: (a) Paul Iddon, “Wing Loong 3: The Emergent Threat of Long-Range ‘Intercontinental’ Attack Drones,” *Forbes*, November 21, 2022; (b) Parth Satam, “China Claims 10,000 Km Range for Its Wing Loong-3 UAVs: Performs Anti-Sub, Air, Land & Rescue Ops in a Promo Sortie,” *EurAsian Times*, November 10, 2022; (c) Zaheena Rasheed, “How China Became the World’s Leading Exporter of Combat Drones,” *Al Jazeera*, January 24, 2023; (d) OE Data Integration Network, “CH-4B (CH-4B Rainbow) Chinese Unmanned Aerial Vehicle (UAV),” accessed July 8, 2024; (e) US Air Force, “MQ-9 Reaper,” January 2025; (f) Naval Air Systems Command (NAVAIR), “MQ-4C Triton,” US Navy; (g) Abby Shepherd, “MQ-4C Costs Rise by 117%, Final Version Estimated at \$618 Million per Unit,” *Inside Defense*, July 9, 2024. The initial unit cost for each MQ-4C was around \$250 million. When the Navy reduced its purchase to only twenty-seven airframes from seventy, the unit cost jumped to around \$600 million.

numbers could reach the thousands by 2030.<sup>50</sup> By comparison, all American UAS platforms used for naval scouting are expensive, with just a few hundred units in service.<sup>51</sup> The Wing Loong II is China’s answer to the US MQ-9A Reaper.<sup>52</sup> Although the Wing Loong II has some performance limitations compared with its American counterpart, its \$1–\$2 million price tag—compared with the Reaper’s

\$25-plus million—allows for much broader deployment.<sup>53</sup> The BZK-005 MALE UAS provides impressive forty-hour endurance, while the WZ-7 Soaring Dragon HALE UAS offers advanced reconnaissance capabilities comparable to the US RQ-4 Global Hawk.<sup>54</sup>

The limited US UAS fleet must operate from distant bases and are likely to be vulnerable in contested airspace. New systems like Aero-Vironment's RQ-20B Puma cost only around \$250,000 per unit, but their very limited 20-kilometer range makes them unsuitable for most situations.<sup>55</sup> The US must develop a middle ground: a collection of affordable UAS with sufficient range to scout, capable of being fielded in numbers that can sustain combat losses. Without such systems, the US could quickly lose the scouting fight to China, severely limiting its ability to strike needed targets.

The DOD should foster the most intense competition possible in the private sector for reconnaissance drones at this price point and below. It is already moving in this direction but needs congressional support to move more aggressively. Two notable initiatives are the DOD's Replicator and Hellscape programs, announced in 2023 and 2024, respectively. These programs aim to field "multiple thousands" of UAS within twenty-four months, according to Deputy Secretary of Defense Kathleen Hicks, suggesting that the US planners see drones as essential for both scouting and strike in the early phases of any regional contingency.<sup>56</sup>

Since PLA planners can anticipate the US interest in using drones, the US scouting UAS fleet needs to be hardened enough to operate despite the disruption PLA electronic warfare and antisatellite warfare will cause.<sup>57</sup> Drone-enabling systems, discussed in chapter 7, will be essential in any conflict scenario.<sup>58</sup> They are potentially useful for multiple types of drones. Nonsatellite control systems are technologically challenging to develop but could be crucial if US space assets are taken offline, an issue discussed in chapter 9.<sup>59</sup> Most of the details are classified, but various approaches are being considered, some of which could be operationalized quickly.

## Conclusion

This chapter has explored the pivotal role of surveillance and reconnaissance in naval combat. Precision strike systems rely on effective scouting to locate and communicate enemy targets over vast distances. Over the past century, scouting technology has steadily increased the range of engagements in air-naval warfare, thereby becoming increasingly important on both the strategic and tactical levels. China understands this. The US deterrence strategy and force structure in the Indo-Pacific must reflect this reality, too.

The United States and China are locked in an intense competition to develop and disrupt each other's scouting networks. Both nations are investing in satellites, drones, manned aircraft, and other sensors to maintain reconnaissance advantages. This peacetime scouting competition has strategic implications for the entire region. The United States faces challenges in building a large, affordable fleet of scouting assets to match China's growing capabilities. To keep up, it will need to keep innovating technologically while streamlining procurement processes to ensure that its reconnaissance and communications networks remain flexible and resilient in potential conflict scenarios. Drones and satellites will be critical to maintaining the US counter-scouting advantage. Recognizing that even the most resilient space-based networks will never be invulnerable, the United States will ultimately need to create an integrated ISR system that allows units forward-deployed to the First Island Chain to operate their own ISR and counter-scouting techniques, both high tech and low tech, that mask their communications and confuse enemy targeting.