

# Air and Space Power with Chinese Characteristics

## China's Military Revolution

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### China's Strategic Revolution

A quarter-century ago, China's air force and its naval air arm—the People's Liberation Army Air Force (PLAAF) and the People's Liberation Army Navy Air Force (PLANAF)—were largely composed of, at best, short-range aircraft of an obsolescent design with minimal offensive capability. China had no aircraft carriers, and its conventional missile force was largely short-ranged and inaccurate. Its nuclear force was small and composed primarily of unsophisticated land-

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based missiles. These forces were largely suited for a poor country with a military strategy primarily concentrated on territorial defense and deterrence of attack on the Chinese homeland.<sup>1</sup>

Those days are largely gone, and the days of Western military superiority over China are ending if not already over. China has become a partially modernized economic superpower, and while their announced military strategy defines itself as strategically defensive, it proclaims itself to be operationally and tactically offensive.<sup>2</sup> China has conducted a massive—and continuing—program of military modernization, which has deployed much more capable systems that provide vastly more offensive capability against targets in neighboring states. Functionally speaking, this program translates to a goal of military dominance of the Western Pacific (WestPac) in what must be considered a strategic revolution in the region.

### **Offensive Air and Space Power with Chinese Characteristics**

The Chinese have exhaustively studied the American way of war. They have concluded that it is immensely powerful but potentially brittle, meaning it has a variety of key vulnerabilities that, if attacked, could severely cripple or even collapse the entire system.<sup>3</sup> They have heavily concentrated their strategy and systems to target these vulnerabilities. Since American military strategy is critically dependent on air, space, and naval power, the central requirement of Chinese wartime military strategy will undoubtedly be the neutralization of that power. We can expect the Chinese efforts to do this to have several overlapping aspects of both offense and defense that—together at a minimum—call for more and more ambitious defense in depth (commonly called *antiaccess/area denial*) of the Chinese mainland.<sup>4</sup> This strategy will be done by:

- neutralizing forward-based deployed forces
- denying access to reinforcing forces
- defeating power projection against China
- neutralizing American and allied command, control, communications, computers, and intelligence, surveillance, and reconnaissance (ISR), especially space systems

Not surprisingly, they are preparing to do this their way, emphasizing asymmetric means, and have increasingly developed what this author will call *offensive air and space power with Chinese characteristics*. In particular, these characteristics involve the following:

- dependence on large numbers of increasingly long-range and accurate conventional ballistic and cruise missiles for power projection
- the deployment of large numbers of modern combat aircraft
- the development and deployment of a major unmanned air system capability
- the deployment of an integrated air defense system (IADS) that can reach far offshore
- the development of antisatellite (ASAT) capability
- minimal reliance on nuclear weapons

Also, they are probably laying the basis for a major extra-regional intervention/deployment capability.

This article will examine each of the characteristics in turn.

### **Long-Range, Accurate Conventional Ballistic and Cruise Missile Deployment**

Due to the geography of WestPac, almost all American and allied bases in the region are close to China, few in number, and mostly unhardened. Further, even hardened facilities are not necessarily proof against modern precision-guided munitions,<sup>5</sup> and usually lightly defended, especially against ballistic missile strikes. Due to the dense population of most of the region, there are only a few potential dispersal bases, and, as a rule, these dispersal bases face similar problems. All this makes them especially vulnerable to a short-warning (i.e., missile) attack. The Chinese have targeted this vulnerability, and one of the defining characteristics of Chinese offensive air and space power is the centrality of conventional missiles. China has deployed a large force of conventional tactical ballistic and cruise missiles, mostly under the People's Liberation Army Rocket Force, for use against land targets and, increasingly, ships. When deployed in sufficient numbers in at most the not very distant future,<sup>6</sup> this force could give them the potential capability to stage a comprehensive, integrated conventional surprise attack against American and allied air and naval bases in WestPac.

### **Land Attack Ballistic Missiles**

As noted, China has deployed a large force of conventional tactical ballistic and cruise missiles. They have steadily expanded the capabilities of this force with precision-guided systems. (As early as 2011, the DF-15C reportedly had a terminally-guided warhead for use against fixed targets.)<sup>7</sup>

The Chinese have a force of up to 1,500 conventional short-range ballistic missiles (SRBM), with a range up to 1,000 km), although evidently, their force of launchers is significantly smaller (250 launchers).<sup>8</sup> Historically, these missiles have been unguided and short-ranged—most could reach Taiwan but not Okinawa.<sup>9</sup> However, China is now deploying upgraded missiles with longer range and precision guidance that from coastal launch sites can reach not only Okinawa but also most of Kyushu and much of Luzon.<sup>10</sup> In addition to SRBMs, the Chinese were reported to have deployed up to 450 medium-range ballistic missiles (MRBM) in 2019, with a range of between 1,000–3,000 km,<sup>11</sup> on 150 launchers.<sup>12</sup> Up to 40 of these launchers and up to 80 missiles may have nuclear warheads.<sup>13</sup> Further, the Chinese are deploying a version of the longer-range DF-26 intermediate-range ballistic missile (IRBM) that can reach Guam.<sup>14</sup> China announced the commissioning of a brigade with at least 22 launchers in April 2018,<sup>15</sup> and in 2019 were reported to have up to 160 of them on 80 launchers.<sup>16</sup> In 2017, they were reportedly practicing missile strikes against mockups of Pacific air and naval facilities.<sup>17</sup>

Also, the PLA (the Chinese land force, not the rocket force) has deployed the B-611, an artillery rocket with a half-ton warhead intended for tactical use.<sup>18</sup> It has a range of up to 250 kilometers,<sup>19</sup> which would put much of Taiwan, especially northwestern Taiwan, within range if launched from coastal sites. If equipped with a satellite navigation system, the B-611's accuracy would be as good as 30 meters.<sup>20</sup> No information is available as to the number deployed, but if deployed in any numbers, it could obviously be employed to supplement any rocket-force SRBM operations against Taiwan.

### **Long-Range Land Attack Cruise Missiles**

China has currently deployed a force of up to 540 CJ-10/DH-10 and DH-10A long-range (up to 2,000 km) ground-launched land attack cruise missiles (LACM) on 90 launchers, although the launchers carry multiple missiles.<sup>21</sup>

Recently, the Chinese have started deploying long-range air-launched CJ-20 cruise missiles (the air-launched version of the DH-10) on their H-6K bombers,<sup>22</sup> the upgraded Chinese version of the Russian-designed Tu-16 Badger. They are reported to currently have 36 such bombers in the PLAAF inventory, each of which can carry up to six CJ-20s.<sup>23</sup>

China may also be developing a next-generation ground-launched cruise missile.<sup>24</sup> The HN-2000 is supposed to be stealthy, equipped with advanced sensors (millimeter-wave radar, imaging infrared, laser radar, and synthetic-aperture radar), and use a guidance system based on the Chinese Beidou satellite navigation system. It is also reported to have a supersonic terminal flight phase and an ex-

pected range of 4,000 kilometers.<sup>25</sup> China is starting to deploy a large new cruise missile,<sup>26</sup> but so far, there is no way to tell if this is the HN-2000.

### **Other Launch Platforms**

Beyond these platforms, we must expect additional LACMs can be launched from other aircraft, PLA Navy submarines, surface ships, and forward island bases, potentially from containers on civilian ships,<sup>27</sup> and especially from tactical combat aircraft.

### **Other Long-Range Land Attack Cruise Missiles**

In addition to the long-range LACMs previously discussed, China has deployed shorter-range tactical LACMs, in particular, the KD-88 air-to-surface LACM, with a range of 180–200 km (108–120 miles).<sup>28</sup>

### **Targeting Ships**

In addition to conventional ballistic missiles aimed at land targets, the Chinese are deploying antiship ballistic missiles (ASBM). The primary ship targets for the immediate future will undoubtedly be US aircraft carriers at sea. However, if and when the US Navy expands its concept of distributed lethality to include land attack, it may drastically complicate and increase Chinese targeting requirements.<sup>29</sup>

Part (portion unknown) of the Chinese deployments of MRBMs include the DF-21D ASBM, and part of IRBMs includes the DF-26 ASBM. Press reporting indicates they have deployed “... at least a dozen” launchers for ASBM DF-26s at an inland base.<sup>30</sup> They have started testing these systems against targets in the South China Sea.<sup>31</sup>

Finally, the Chinese have bought and/or developed a variety of antiship cruise missiles (ASCM). Among others, these include the YJ-12 supersonic radar-guided ASCM with a range of up to 400 km and a speed of up to Mach 4 (4,900 km/3,000 mph),<sup>32</sup> as well as the shorter-range supposedly hypersonic CM-401.<sup>33</sup> These missiles can be launched from land, sea, or air platforms.

We must expect the Chinese missile threat will only increase over time, especially from ballistic missiles, since the missiles and the launchers cost less than the measures necessary to counter them. While the PLAAF is currently reported to have only a small supply of tactical air-to-surface missiles,<sup>34</sup> it is reasonable to expect the Chinese will deploy these in much larger numbers.

## Deployment of Large Numbers of Modern Combat Aircraft

Until fairly recently, the PLAAF and the PLANAF were largely equipped with Chinese-built variants of unsophisticated, short-range, single-role second- or third-generation Soviet designs, such as the F-6 (MiG-19) and the F-7 (MiG-21), mostly intended for air defense. This started changing in the 1990s when the Chinese began to acquire Russian fourth-generation Su-27 Flanker-family fighters. It has recently changed rapidly with the Chinese development and production of large numbers of their versions of Su-27/Su-30/Su-33 designs and their fourth-generation designs. These are at least roughly equivalent, if not better than, the F-15s, F-16s, and F-18s that will predominate in the USAF, USN, USMC, and allied inventories for the foreseeable future and give China both a vastly improved defensive capability and a vastly improved offensive capability. In producing these versions, China has reached past cloning foreign (especially Russian) aircraft, and they now design and build modified or new military aircraft, systems, and aircraft weapons with limited or no foreign assistance. They have done this with the following:

**J-11 Flanker family.** These versions are derived from the Russian Su-27 design (and its Su-30 and Su-33 derivatives). When combined with Su-27s and Su-30s acquired and Su-35s being acquired from Russia, the total force is more than 400 aircraft.<sup>35</sup> The Chinese are producing several of their own redesigned versions, which carry Chinese weapons, most significantly the KD-88 ASCM and possibly the YJ-12 ASCM. With a reported combat radius of approximately 1,400 km,<sup>36</sup> these aircraft can potentially reach all targets on Taiwan, the Republic of Korea (ROK), Okinawa, much of mainland Japan, and Luzon from Chinese coastal bases, and most of Japan from Manchurian bases, even without aerial refueling or using the missiles. While it should be noted that many of these aircraft are not necessarily well-equipped or their crews trained for ground or antiship attack, by serving as launch platforms for such missiles, they could still be a threat.

**J-10 Firebird family.** Often compared to the F-16, the Chinese have produced multiple versions of this dual-role aircraft. As of early 2017, they were estimated to have produced as many as 400 of them.<sup>37</sup> They have a reported combat radius of up to 1,000 km.<sup>38</sup> That radius would put bases in Taiwan, Okinawa, the ROK, and much of Luzon in range from coastal bases, potentially most of Japan if they overfly North Korea from Manchurian bases, and more of Japan and the Philippines if they served as a launch platform for KD-88 LACMs or YJ-12 ASCMs.

In addition to the fourth-generation aircraft, China is continuing to deploy other combat aircraft. These aircraft include the JH-7/7A Flounder fighter-bomber. As of 2017, the Chinese had at least 246 JH-7/7As, divided between the

PLAAF (30–40 aircraft) and the PLANAF, with 216.<sup>39</sup> With a reported combat radius of more than 1,600 kilometers,<sup>40</sup> China can potentially reach all bases in the ROK, southern Japan, and Luzon from Chinese coastal bases even without aerial refueling or ASMs. The JH-7 can also carry the KD-88 and the YJ-12.<sup>41</sup> Also, the Chinese are continuing to deploy and upgrade the H-6 medium bomber. The Chinese intend these as missile carriers; the PLAAF H-6K can carry up to six LACMs,<sup>42</sup> and some reports indicate the PLANAF H-6Js, the latest H-6 version, can carry as many as seven YJ-12s.<sup>43</sup>

China is working on combat aircraft with stealth characteristics. They may have recently started the initial production of the J-20, an aircraft larger than the F-22 with at least limited stealth.<sup>44</sup> While reports on its performance are fragmentary, some reports estimate its combat radius as over 1,800 km.<sup>45</sup> Also, the Chinese are testing (and offering for foreign sales) a second, smaller, stealth fighter—the J-31—which is reported to have a similar combat radius.<sup>46</sup> The intended role of these aircraft is as of yet uncertain, but prudence demands we assume they will be dual-role and capable of carrying at least tactical LACMs and ASCMs. The Chinese are also developing a stealth strategic bomber, called the H-20, and a next-generation fighter-bomber, presumably stealthy.<sup>47</sup> Both bombers can be expected to carry LACMs, and, for the fighter-bomber, at least ASCMs.

The Chinese still have a large force of obsolescent F-7 and F-8 fighters and a substantial number of obsolescent Q-5 ground attack aircraft. We should expect them to be replaced with modern aircraft over time—the Chinese are building more than 100 fighters per year.<sup>48</sup> As part of this procurement, the Chinese may intend to procure up to 500 J-20 fifth-generation aircraft.<sup>49</sup> China also reportedly has two air-launched ballistic missiles in development, one of which may be nuclear-capable.<sup>50</sup> If and when deployed, they can be expected to functionally increase the capability of their launch aircraft.

### **Major Effort to Develop and Deploy Unmanned Air Systems**

The Chinese have made a major development effort in unmanned air systems (UAS), and they have established a potentially impressive UAS technology and production base.<sup>51</sup> (They have even sold UASs to American allies such as Jordan, Saudi Arabia, and the United Arab Emirates and have also provided armed drones to Iraq.<sup>52</sup>) Publicly available information about the actual number of Chinese military UASs currently deployed is very fragmented and limited,<sup>53</sup> and vary widely. (While the PLA was reported to have 280 UASs in service in mid-2011, a 2014 estimate gave them at least 1,000 medium and large UASs, which, if true, would have indicated a huge buildup.<sup>54</sup>) They are reportedly intending a massive procurement of UASs, with the *2015 Annual Report to Congress* indicating that

China possibly plans to produce more than 41,800 land- and sea-based unmanned systems, worth about \$10.5 billion, between 2014 and 2023. However, the report did not provide specifics as to their possible role and capability, especially their potential armament.<sup>55</sup>

### **ISR Unmanned Air Systems**

Much of the Chinese UAS effort is in ISR systems. These systems include at least two reported analogs to the American high-altitude long-endurance Global Hawk—the Divine Eagle and the Xianglong/Soaring Dragon, both of which have entered production.<sup>56</sup> Also, they are developing a large unmanned airship and several systems for the medium-altitude, long-endurance (MALE) UAS role.<sup>57</sup> The most widely reported MALE systems are the Yilong/Wing-loong and the BZK-005, roughly similar to or larger than the American Predator, and the CH-5, roughly equivalent to the American Reaper.<sup>58</sup> The MALE systems, like their American counterparts, also can carry bombs and missiles.<sup>59</sup> Further, they also have deployed the WJ-600 (35 reported produced as of mid-2019.<sup>60</sup>) It has been advertised in an ocean-reconnaissance role, supposedly intended to hunt US aircraft carriers, but has also been reported to have a ground-attack capability.<sup>61</sup>

### **Unmanned Combat Air Vehicles**

The Chinese program includes the development of unmanned combat air vehicles (UCAV). Some reports indicate that in the “near [timeframe unspecified] future,” the PLAAF could have at least five UCAV regiments, each with at least 100 attack UCAVs.<sup>62</sup> The PLAAF is reportedly working on at least three stealthy UCAVs, although as of mid-2019, there are no public indications that any have started operational deployment. One of these is the supersonic Anjian (Dark Sword).<sup>63</sup> First reported several years ago, unconfirmed reports indicate it may have started testing in 2014.<sup>64</sup> The second stealth UCAV design, the Lijian (Sharp Sword), may have started testing in 2013.<sup>65</sup> The third design is the CH-7, which may make its first flight in 2019.<sup>66</sup>

Finally, in the past, China may have converted at least 200 of their retired J-6 (Chinese-manufactured MiG-19) and some J-7 (Chinese-manufactured MiG-21) fighters into drones or UASs,<sup>67</sup> with the obvious potential of being used as decoys to drain supplies of defensive systems.

### **“Beetle Bomb” Threat—Small Unmanned Combat Air Vehicles**

The Beetle Bomb threat—more correctly the low, slow, and small (LSS) threat—is a rapidly emerging but only partially recognized threat that the Chi-



nese are working to exploit.<sup>68</sup> While the danger to operations at airports posed by small, cheap drones ('hobby drones') is widely recognized (the Federal Aviation Administration has established a 30-mile radius, no-drone zone around Reagan National Airport south of Washington, DC),<sup>69</sup> the threat posed by swarms of such drones to air bases has only gradually been recognized. While the potential danger of such drones to airports that has so far drawn the most attention is the possibility of collisions with aircraft, the dangers they pose to air operations at military air bases are potentially far more comprehensive. Along with the possibility of a collision with aircraft, these dangers are:

- LSS could, literally, be beetle bombs—small flying bombs sent against air base facilities, aircraft, and personnel. They could employ a variety of tactics—fly the beetle bombs directly into targets, or have them drop undetonated explosives and then crash. The explosives would be the equivalent of unexploded bombs needing to be removed or disarmed. At the same time, the crashed mini-UAVs would have to be removed before pieces get sucked into an engine—a small piece of junk can ruin a very expensive engine and ground a plane.
- By having weapons and cameras installed, they could be used to target personnel and aircraft.
- Even if they aren't used as bombs, by crashing or just scattering scrap on runways, they could disrupt operations until cleared. Further, since this doesn't directly kill anybody, this tactic could also be used against reinforcing bases (and for that matter, civilian airfields) in the US while minimizing the risk of escalation.

Of equal significance, these aren't necessarily one-time threats. By preparing in advance and taking advantage of Chinese economic penetration of its neighbors and/or the US, they could release individual beetle bombs or swarms of them at intervals from garages in a nearby town, from prepositioned containers, or a ship in a nearby harbor) as a harassment tactic. More ambitiously, they might be locally produced using three-dimensional printers.

Finally, if they have significant range and flight time, beetle bombs could be released from one or multiple points and programmed with a variety of courses as a multidirectional threat.

Regarding the future of the Chinese UAS threat, while the deployments so far look rather modest, clearly, the Chinese recognize the immense potential of these systems, and they obviously intend to develop and harvest that potential over

time. They are also reportedly pursuing developments in new directions, including a manned-unmanned teaming UAS.<sup>70</sup>

### **Deployment of an Integrated Air Defense System that Can Reach Far Offshore**

As a rule, air defenses are not considered part of offensive air and space power. However, depending on their range and location, they could potentially be used in that role, which is the case here. The Chinese are deploying an IADS, based especially on modern, long-range surface-to-air missiles (SAM). When deployed along the Chinese coast or on ships or offshore islands,<sup>71</sup> these SAMs have the potential to reach up to several hundred kilometers beyond their coastlines. This missile deployment could potentially deny, or at least disrupt, friendly operations within their range, in particular at bases on Taiwan. Especially vulnerable would be the large support aircraft like tankers and airborne early warning and control system (AWACS) that act as major force multipliers.

Along with being one of the major buyers of advanced Russian SAMs, including SA-20s and S-400s/SA-21s, China is currently producing at least four advanced long-range SAMs based on Russian designs:

- the HQ-9 Chinese-built SA-10, which the PLAAF has claimed has a range of 200 kilometers and a speed of over Mach 4.
- the HHQ-9 (the naval version of the HQ-9)
- the HQ-15 (upgraded SA-10)
- HQ-18 (Chinese-built SA-12, which presumably means the Chinese have a tactical BMD capability)<sup>72</sup>

They are also building the FT-2000 missile system, which uses an antiradar seeker intended to target airborne warning aircraft and electronic warfare aircraft.<sup>73</sup> The FT-2000 has also been reported as having the ability to intercept tactical ballistic missiles.

Parallel to this, the Chinese Navy is steadily deploying modern ships carrying advanced SAMs, including a class of at least eight (so far) 055 guided missile cruisers, with 112 vertical launch tubes for HHQ-9s each.<sup>74</sup> Further, their Type 052D air defense destroyers, which the Chinese are mass producing (as many as 20 were deployed or being fitted out as of May 2019, and they may intend to deploy a class of 24) carry up to 88 HHQ-9 missiles in vertical launch cells.<sup>75</sup> If the Chinese deploy these ships within the land-based SAM envelope as a forward line of defense and can integrate the SAM systems of these ships with the IADS

(admittedly a major assumption), it will potentially extend the reach of the IADS even further offshore.

Reinforcing the SAM threat is a long-range air-to-air missile (AAM) capability the Chinese are working to build. The PL-15 may have a maximum range of up to 200 kilometers, especially against large nonmaneuvering targets such as AWACS and especially the tankers that US tactical aircraft need because of their short ranges, and the Chinese may be developing an AAM with a range of up to 400 km.<sup>76</sup> Further, they are developing ramjet engines that could drastically increase the range and further increase the speed of existing shorter-range missile designs.<sup>77</sup>

We must expect the SAM threat to continue to increase as the Chinese buy and/or duplicate the capability of the advanced SAM systems the Russians are building. (The Chinese technological base has got to the point where we must assume that they can duplicate anything the Russians can build.) The 40N6 missile of the Russian S-400 system has been tested to a range of up to 250 miles, and a missile from the Russian S-500 system, currently in development, has reportedly intercepted a target 299 miles away.<sup>78</sup> It will further increase if/when the Chinese deploy fighter aircraft with long-range AAMs.

### **Development of Antisatellite Capability**

The Chinese have viewed space systems as a critical American asset and a major potential US vulnerability for many years.<sup>79</sup> Therefore, in addition to cyber attack and jamming,<sup>80</sup> they are developing a wide variety of ASAT systems and dual-use technology with ASAT potential, and their ASAT capability probably already exceeds that of the USSR in the Cold War.

Beginning in 2005–07, China launched multiple tests of the SC-19, a ground-based direct-ascent ASAT missile capable of reaching low-earth orbit, at least one of which was successful against an aging Chinese weather satellite.<sup>81</sup> They are also reportedly working on additional direct-ascent systems, the DN-2 and the DN-3, capable of attacking satellites in higher orbits, possibly including geosynchronous orbit.<sup>82</sup>

In past years, both American and French satellites were hit with dazzle lasers from China. (Such incidents have been reported at least as far back as 2006.<sup>83</sup>) No permanent damage was reported, although the Chinese claim they blinded a satellite in 2005 using a 50–100 kilowatt laser,<sup>84</sup> but it must be taken as an indication that the Chinese are experimenting with ASAT lasers and can be expected to develop more powerful ones.<sup>85</sup> Some reports indicate the Chinese may have as many as five directed-energy weapon ASAT sites.<sup>86</sup>

The Chinese have been testing satellite rendezvous techniques, starting in 2008 with the BX-1, and then with the unmanned Shenzhou 8 mission in November

2011, which rendezvoused with the Tiangong-1 orbiting laboratory.<sup>87</sup> While both of these tests were performed over a considerable period of time as the maneuvers for the 2010 rendezvous took several weeks,<sup>88</sup> the basic technology has obvious ASAT development potential. More recently, in late 2016, they launched the SJ-17 experimental satellite, which conducted extensive maneuvering, including approaching to within “a couple of hundred meters” of a supposedly dead Chinese communications satellite.<sup>89</sup>

The Chinese may be developing a multistage spacecraft launch system mounted on a version of the H-6. While the spacecraft to be launched are reportedly small (50 kg), this technology also has obvious ASAT development potential.<sup>90</sup>

### **Limited Reliance on Nuclear Weapons**

China’s declared nuclear strategy is that its nuclear weapons are to deter the use of nuclear coercion or nuclear weapons against China, and China will not use them first or threaten to use them against nonnuclear weapon states or nuclear weapon free zones.<sup>91</sup> However, there is some uncertainty as to what the Chinese will consider a threshold triggering retaliation: Chinese officials have privately said attacks on Chinese nuclear forces with conventional weapons will provoke a nuclear response.<sup>92</sup> Also, there have been reports in the past that the Chinese may have started deploying nuclear electromagnetic pulse warheads on some of their missiles.<sup>93</sup> If true, this would mean the use of nuclear weapons in a nonstrategic role, further calling into question the Chinese commitment to no-first-use.<sup>94</sup>

Historically, Chinese strategic forces have consisted primarily of a monad of land-based missiles, ambiguously supplemented with a small force of nuclear weapons carried by bombers. China is currently estimated to have a modest force of land-based nuclear ballistic missiles. The core is a force of approximately 90 ICBMs, which means the size of the ICBM force has not changed much in recent years, since in 2016 it was estimated at 75–100 ICBMs.<sup>95</sup> Also, China has a force of 80–100 shorter-ranged land-based nuclear missiles.<sup>96</sup>

More recently, China has expanded its strategic nuclear forces to a dyad, with the building of six Type 094 JIN-class missile submarines (SSBNs), each with 12 JL-2 submarine-launched ballistic missiles.<sup>97</sup> Four of the SSBNs are operational, with two more fitting out.<sup>98</sup>

The Chinese are continuing to gradually modernize and modestly enlarge their strategic nuclear force, with the following programs ongoing:

- Developing and deploying mobile, solid-fuel ICBMs with multiple independently targeted reentry vehicle warhead capability. For example, the DF-41 ICBM may be able to carry as many as 10 warheads.<sup>99</sup>

- They reportedly intend to start the construction of a new class of SSBN—the Type 096—with longer-range JL-3 missiles, in the 2020s. Public reports vary as to the number intended with public estimates ranging from four to six boats.<sup>100</sup>
- As previously noted, the Chinese are developing the H-20 strategic bomber, which must be assumed to have a potential nuclear role. Also, China reportedly has experimented with the H6K as an airborne launcher for the DF-21 MRBM missile.<sup>101</sup> Presumably, this is intended for a nuclear role since, while this would provide a much longer range for the missile, it is an extremely inefficient method for deploying conventional missiles.

### **Increase in Power Projection Capability**

This aspect of offensive air and space power, especially at long distances from the Chinese homeland, has historically been something of an afterthought with the Chinese. That is changing rapidly, however, with the Chinese undertaking major improvements in support aircraft and aircraft carriers.

### **Improvement in Support Aircraft**

Until very recently, the Chinese have had a very modest airlift capability, centered mostly around a small number) of Il-76s purchased from the Russians.<sup>102</sup> They attempted to buy a larger batch (38 aircraft) of Il-76 transports and Il-78 tankers from Russia, but the deal died due to problems on the Russian end.<sup>103</sup> Also, they have had a very small force of tankers.

They may be in the early stages of change, in particular with the development and deployment of the Y-20 transport, an aircraft roughly comparable in size to the US C-17, although its range and carrying capacity are currently somewhat less.<sup>104</sup> While the Chinese government has not announced the number to be procured, in 2014, the PLA National Defense University issued a report saying that China might require up to 400 such aircraft.<sup>105</sup> An aviation industry spokesman called for the production of more than 1000, which may include procurement for other roles, such as an airborne tanker version that has reportedly started testing.<sup>106</sup> Other sources claim the Chinese may only procure about a hundred and then procure a larger, more capable transport.<sup>107</sup>

Also, China has reportedly reached an agreement with Ukraine to resume production of the very heavy AN-225 transport. China expected to receive the first one “by 2019.”<sup>108</sup> Some reports indicate the planes are being built in China.<sup>109</sup>

Finally, the Y-9, intended to be a C-130J equivalent, has also entered production.<sup>110</sup> They may be testing a redesigned version with new engines and a glass cockpit,<sup>111</sup> although this may be additional information on the previous design. The Y-9 also serves as the platform for the KJ-500 AWACS.<sup>112</sup>

We must expect the Chinese are in the early stages of a major increase in their air transport force, which will, over the longer term, greatly increase their mobility/intervention capability both regionally and at longer ranges. For the longer term, we must also note that China has declared the intention to build a world-class commercial aviation industry. However, so far, they are having trouble producing even a small world-class-quality airliner. Although they are (with the Russians) working on the CR929, a four-engine widebody transport the size of a Boeing 767, the largest aircraft currently near production is the C919, equivalent in size to a Boeing 737 or an Airbus 320, which probably makes it unsuited to be anything but a niche military platform. Currently in-flight testing, it is several years behind schedule and, like the rest of the Chinese civil aviation industry,<sup>113</sup> is currently heavily dependent on foreign suppliers for subsystems. Its design is a generation behind the upgraded 737 and 320 designs now in production. However, a huge domestic Chinese market (along with a presumed Chinese government order for Chinese airlines to buy Chinese-made aircraft whether they want to or not) can be expected to eventually give the Chinese at least a modest foot in the door of civil aircraft production. The market will also provide a basis to build on, and, over time, potentially to build a Chinese equivalent to the American Civil Reserve Air Fleet, where civilian airliners can be mobilized for military support. We should note that, as in the Soviet/Russian example, problems with civilian production will by no means prevent them from producing world-class military equipment.

### **An Aircraft Carrier Force**

The PLAN is in the early stages of deploying an aircraft carrier force. Although the role of the force is currently ambiguous, a large force of carriers must be considered inherently offensive.<sup>114</sup> The Chinese Navy has announced it intends to shift its focus to “open seas protection.”<sup>115</sup> They have reconditioned the former Russian VARYAG, commissioned it into the fleet as the LIAONING,<sup>116</sup> and have built a similar carrier, currently undergoing sea trials.<sup>117</sup> They are also building a second conventionally-powered aircraft carrier that, unlike the previous two, is being equipped with a catapult rather than a ski-jump for launching aircraft.<sup>118</sup> As previously noted, they have deployed and are continuing to build a large force of the types of ships, especially guided missile cruisers and air defense destroyers (at least eight Type 055 guided-missile cruisers and up to 20 Type 052D air defense destroyers so far) that would logically be used for the defense of the task

forces that would be built around such carriers. They are also building the aircraft force for a carrier navy, including the J-15, (based on the Su-33, the carrier version of the Su-27), the KJ-600 radar plane, and reportedly a drone.<sup>119</sup> A variant of the J-31 may also be intended for carrier use.<sup>120</sup>

Plans for the future of the carrier force are still unknown, in particular, whether China will build another conventionally-powered carrier or move directly to constructing nuclear-powered ships. Also uncertain is the number of carriers to be built and how fast China will build them—some estimates expect a force of four nuclear carriers by 2035, with the first nuclear carrier to be launched as early as 2022.<sup>121</sup>

## **Conclusions and Implications**

Even though China has only partially modernized, it must already be considered an economic superpower, and it is emerging as a military superpower. Most important for this analysis, when the size, increasing capability, and modernity of its air, missile, and space forces and the increasing potential of its technology and production base are considered, it must also be considered an emerging air and space superpower. The comprehensive and continuing modernization of its offensive air and space power potential that China has undertaken and is continuing to undertake has what must be considered revolutionary implications for the Indo-Pacific region and ultimately for the world. China obviously intends to change the security architecture in the region and establish itself as the dominant military power there. Chinese economic and military power is reaching, if it has not already reached, the point where it must be considered a peer competitor of the United States, at least in the WestPac region.

These deployments are clearly intended to prevent the United States from using its preferred post-Cold War military strategy of overwhelming its enemies with its superior military and technological might. To an ominous degree, they have succeeded, and the days of Western military superiority over China are ending, if not already over. China's deployment of large numbers of ballistic missiles, modern aircraft, and cruise missiles means our bases and the oceans in WestPac are no longer sanctuaries.<sup>122</sup> If integrated with modern C4ISR systems (C4IKSR to the Chinese, who include "kill" in the mix<sup>123</sup>) and used effectively—admittedly very big 'ifs'—this should be more than adequate to overwhelm any air defenses Taiwan can plausibly mount. All too plausibly, they will be enough to overwhelm American and Japanese base defenses in the region, including on Okinawa. A significant Chinese antiship ballistic missile deployment will pose a major threat to surface ships operating within the First Island Chain in the Yellow Sea, Taiwan Strait, East China Sea, and at least much of the South China Sea. They will also

pose an increasingly dangerous threat to American or Allied bases as far away as Guam, and require that any American military counteraction to a regional Chinese military move will risk a major war.

And given the will and resources, the Chinese have no obvious reason to stop their deployments. While they may not yet have the global reach, alliance networks, and basing structure of the United States, their investments in power projection (including their investments in amphibious capability which this article didn't discuss) and their plans for the Belt and Road Initiative, where they plan to at least acquire access and influence in much of Eurasia and Africa, if not buy themselves an empire,<sup>124</sup> should probably be considered strategic warning that they intend to acquire them.

The Chinese have made clear that they intend to become a scientific and technological superpower. How fast they can do this is uncertain. While much is made about the huge numbers of engineers and scientists they are supposedly training, the Soviets made similar claims back in the 1960s, which turned out to be very overstated.<sup>125</sup> Nevertheless, the Chinese are making great investments in growing their scientific and technological base at a time when substantial portions of American opinion are skeptical of science if not openly hostile to it. We should not take their efforts lightly. We can no longer assume technological superiority—the technical sophistication of many or most of their weapons and aircraft may be at least as good as ours. Further, the Chinese science and technology base is becoming advanced enough in at least some areas, such as, for instance, hypersonics and artificial intelligence,<sup>126</sup> that we cannot rule out the possibility of technological surprise. Beyond that, we should remember that even a comparatively have-not nation can develop and spring nasty technological surprises, as the Japanese did with the Mitsubishi A6M Zero Fighter and the Type 93 “Long Lance” torpedo at the start of World War II.

Finally, we must note that all that has been done so far has been done without crash programs on an economy significantly smaller than that of the US and without imposing a crushing burden on the Chinese economy. What will they be able to do if and when the size of their economy matches or surpasses that of the US in the next decade or so, and their military spending matches or surpasses that of the US without having to pay American military manpower costs?

In conclusion, the days when the US could take its status as the world's leading superpower and premier air and space technology superpower for granted may not be over. But it clearly *is* time to realize that our status cannot be taken for granted and to keep a very close eye on the competition. Above all, we need to recognize that our military strategy against China, and, in fact, our entire way of war, may be dangerously obsolete, and a comprehensive rethinking and a new strategy, one



aimed at exploiting China's strategic vulnerabilities in an environment where we are not militarily or technologically dominant, is now a critical necessity. 🌟

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