

# Meet the New PLAAF

By Rebecca Grant

**C**hina's air force—the People's Liberation Army Air Force—has emerged in recent years as an upstart competitor in the realm of airpower. “All indicators point to the continued improvement of the PLAAF over the next decade, to the point where China is expected to have one of the world's foremost air forces by 2020,” said the US Air Force's National Air and Space Intelligence Center (NASIC) in an authoritative 2010 report.

The PLAAF put itself in the headlines around the world by rolling out the J-20 with its first public flight in January 2011. The stealthy aircraft's first flight was one dramatic example of a steady process of modernization based on outright purchases from Russia, licensed production agreements, and China's own aircraft development by leading prime manufacturers Shenyang Aircraft Corp. and Chengdu Aircraft Industry Group.

Fighters aren't the only new capabilities. China has added advanced missiles, upgraded its venerable H-6 bombers, and pressed ahead with airborne early warning. China's air

force operates numerous advanced air defenses. In the last few years, progress in doctrine and training has picked up speed. Last but not least, China has an aircraft carrier undergoing sea trials.

Today the new PLAAF is reorganized, modernized, and in the hunt for control of the air.

## Geopolitical Response

China's airpower ambitions come from its own direct experience and from observing the success of the US and its allies in crafting airpower into an asymmetric advantage. One major catalyst for change was the 1996 Taiwan Strait Crisis, when China threatened Taiwan, through short-range ballistic missile tests and military exercises, and US Navy aircraft carriers made transits of the strait in a show of force.

Amy Chang of the US-China Economic and Security Review Commission wrote in a recent report that the crisis “catalyzed investment in the long-term modernization and professionalization of China's armed forces. If there had been uncertainty before as to what the United States might do in a Taiwan scenario, this seemed to

be a clear statement that US forces would intervene—and that the PLA lacked effective capabilities to deter or defeat them.”

A June 2012 Center for Strategic and International Studies (CSIS) report on Asia stated, “In particular, China realized after the Taiwan confrontations that it possessed a limited set of military options (short of nuclear weapons) and that US power projection in the form of aircraft carriers and long-range precision strike (e.g., B-2 bombers) to deter Chinese aggression were insurmountable for the PLA.”

China entered the second decade of the 21st century on track to wield a much wider range of conventional force options and with improved airpower capabilities out in front. No longer is the PLAAF “an overly large, technologically inferior force,” stated NASIC. Divestment and investment have reshaped China's two-tier air forces. The PLAAF is moving into position to capitalize on geographic strengths and raise the stakes very high for an opponent should a crisis arise. It is worth recapping how all this came to be.

## China has learned a lot from USAF.



*An H-6 long-range bomber lands in China's Anqing province. China has embarked on an ambitious revamp of its air arsenal, including upgrades to its bomber fleet.*

Photo via [chinesemilitaryreview.blogspot.com](http://chinesemilitaryreview.blogspot.com)

### China's Fighter Modernization

By far the most significant development for the PLAAF has been the shift from a large force of outdated, 1960s-vintage fighters to a smaller, more capable force. Today's PLAAF features several fighters brought into service in the 2000s. Some were purchased from Russia, while others were built under license by China's two major combat aircraft manufacturers, Shenyang Aircraft Corp. and Chengdu Aircraft Industry Group. Together they total nearly 400 aircraft whose aerodynamic characteristics and armament may be close to par with US fighters, excepting the F-22.

The PLAAF describes its force structure as a two-tier system. "The PLAAF has established a major weapons and

equipment system with third generation aircraft and surface-to-air missiles as the mainstay, and modified second generation aircraft and surface-to-air missiles as the supplement," as China described it in a 2008 national defense document.

The Pentagon's 2012 China military report tallies 1,570 fighters, 550 bombers, 300 transport aircraft, plus another 1,450 older aircraft in the PLAAF inventory. However, the report does not offer a thorough order of battle.

A more detailed way to look at the PLAAF is by its own metric of "mainstay" and "supplement" forces. The mainstay forces correspond to fourth generation fighters in US terminology. The supplement forces owe much to advances and derivatives of the MiG-

21. The table shows estimates from two sources for fighter and attack aircraft plus the H-6 strategic bomber.

The number range suggests China probably has more than 400 fighters in the fourth generation class by US terminology. Analyst Richard Fisher Jr. expects this number to grow. "Given what can be discerned about production rates, by 2020 it is conceivable that the percentage of 'modern' combat aircraft could exceed 50 percent or be closer to 1,000 in number," Fisher concluded in a late 2011 calculation published by the International Assessment and Strategy Center.

Just as important are improvements in air-to-air missile technology. China once relied on imitations of the AIM-7 family but now has sophisticated short- and medium-range air-to-air missiles in its inventory. The principal types are the R-27/AA-10 semi-active radar/infrared missile; the infrared guided R-73/AA-11 with a range of 18.6 miles; and the active radar homing R-77/AA-12 with a range estimated at 31 to 50 miles. Three of the four main types of fourth generation fighters—the J-10, J-11, and Su-30—carry the long-range advanced air-to-air missile R-77/AA-12 and the indigenous variant PL-12. So does the J-8, bringing the number of potential missile platforms to 776.

### Stealth Competition

Two major Chinese aerospace firms are flying stealthy fighter demonstration aircraft. Of course, both are subsidiaries of AVIC, China's Aviation Industry

<b>MAINSTAY</b>				
	<b>Maker</b>	<b>Type</b>	<b>RAND</b>	<b>AMR</b>
	Chengdu	J-10	120	200
	Sukhoi	Su-30	73	76
	Shenyang	J-11A	116	140
	Shenyang	J-11B	18	
	Xian	JH-7	72	70
Subtotal			<b>399</b>	<b>486</b>
<b>SUPPLEMENT</b>				
	Shenyang	J-8	312	360
	Chengdu	J-7	552	350
	Nanchang	Q-5	120	130
Subtotal			<b>984</b>	<b>840</b>
<b>Fighter/Attack</b>			<b>1,383</b>	<b>1,326</b>
<b>Strategic Bomber</b>	Xian	H-6	<b>82</b>	<b>120</b>

Sources: *Asian Military Review*, "The AMR Regional Air Force Directory 2012," and David A. Shlapak, RAND, "Equipping the PLAAF," in *The Chinese Air Force* by Hallion, Cliff, and Saunders.

J-15 fighters, such as this one, in late November made successful arrested landings on the Chinese carrier Liaoning.



Photo via [chinesemilitaryreview.blogspot.com](http://chinesemilitaryreview.blogspot.com)





**An artist's conception of a pair of J-20 fighters on a mission. The "Mighty Dragon" made its first public flight in January 2011, during a visit to China by then-Defense Secretary Robert Gates.**

Corp. Together, the J-20 and J-31 could represent a design competition similar to the contest between the Lockheed Martin team X-35 and the Boeing X-32 back in 2001. At the least, the new fighters indicate a healthy combat aircraft design base absorbing lessons from multiple international sources and putting them in experimental designs.

The Chengdu J-20 was first to fly. In a 2009 China Central Television interview, Gen. He Weirong, deputy head of China's air force, said stealth fighters were about to undergo test flights and would be deployed in eight or 10 years. The J-20 "Mighty Dragon" made its first public flight in January 2011 during a visit by US Secretary of Defense Robert M. Gates to China.

The J-20's front aspect in particular shows many external stealth design curves and features similar to the F-22. From side and rear aspects, the resemblance fades, due to the block fuselage, canards, protruding engines, and thin vertical stabilizers. For now, it is equipped with Russian-built AL-31F engines. The size of the J-20 suggests it could carry internal fuel plus a large bomb bay suited to known Chinese missile inventories including cruise missiles and extended range air-to-air and anti-ship missiles. RAND analyst David A. Shlapak estimated it might be capable of supercruise, i.e., reaching Mach speed without afterburner.

Second to fly, on Oct. 31, 2012, was the Shenyang J-31 (named by analysts after its tail number), first seen in roll out photos before it took

flight. The J-31 appeared to be a more compact and advanced design. From flattering angles it could almost be the fourth variant of the F-35. "The J-31 is almost certainly designed with the intention to have the potential of operating on aircraft carriers, judging from its enhanced double-wheel nose landing gear" and vertical stabilizers, aviation analyst Bai Wei told *The Times of India*.

The flight of the Shenyang demonstration aircraft leaves little doubt China's two top fighter houses are striving for stealth. In US terms the presence of two X aircraft types would signify a demonstration and validation flyoff competition and put a potential full-scale program less than five years from production.

China's bombers are not new or stealthy but their armament cannot be dismissed. With Russia, China is one of the few air forces to operate a bomber fleet. China's H-6 bomber is an old design derived from the Soviet Union's Tu-16 Badger bomber. The total build was around 150 H-6 bombers shared among the PLAAF and PLA Navy. Up to five were converted to air refueling tankers in the mid-1990s.

By itself, the 1950s-era technology is not impressive. The real story lies in the cruise missiles carried by the H-6. An H-6G bomber first tested an extended-range, air-launched anti-ship missile more than a decade ago in 2001. At least one variant, the H-6K, reportedly can deliver six DH-10 cruise missiles or carry six to eight long-range air-to-air missiles primed for hunting airborne early warn-

ing aircraft such as the E-3 AWACS and E-2C/D Hawkeye.

The DH-10 cruise missile shows Chinese military air attack development in microcosm. The ground-launched missile was first deployed in small numbers in 2008. By 2009, the number of deployed DH-10s was pegged at up to 350 missiles. Current assessments suggest China has between 200 and 500 DH-10 missiles with a 930-mile range. What portion of the inventory consists of air-launched cruise missiles is not known.

Still, this growing capability gives China the ability to create havoc in the air over the Pacific. Estimates suggest the H-6M carries four anti-ship missiles, while the H-6K carries six cruise missiles. China has the option of combining its most advanced H-6 bomber variants with air-launched DH-10 cruise missiles, theoretically increasing the missile's reach to more than 2,000 miles.

Guam and all other locations of US Pacific Command facilities would fall in range of the H-6 bomber given those specifications.

China made its first move for an AWACS-like aircraft more than a decade ago by attempting to buy Israel's Phalcon airborne early warning system. The deal was nixed in 2000 but only after the US House Appropriations Committee threatened to cut US aid to Israel. China has since developed the KJ2000 radar system, mounted now on Il-76 aircraft. Reports indicate China is attempting to modify a Boeing 737-800 to host the radar package. Estimates suggest China has four operational airborne early warning aircraft.

The PLAAF is also tasked with ground-based air defense. The PLAAF took delivery of its first SA-2s in 1958 and has since built a formidable arsenal of legacy SAMs, advanced Russian systems, and their own indigenously modified HQ-9s. Like fighter aircraft, the PLAAF surface-to-air missile fleet has a highly modernized elite force of about 192 launchers on top of a bedrock of approximately 490 legacy launchers.

Of particular concern are the 192 SA-20, SA-10, and HQ-9 type launchers. The SA-10 range is about 50 miles, but the SA-20 variants have ranges between 93 and 124 miles.

Training for the SAM units "focuses heavily on night mobility," according to NASIC. A typical exercise begins with rapid departure, positioning to a preselected launch site, and camouflage and concealment.

The Chinese-developed HHQ-9 is a sea-launched missile that has been dem-

onstrated in launch from Chinese Navy destroyers. Its range is estimated between 47 and 93 miles. With the HHQ-9, China could project lethal air defenses at sea as far as its fleet can maneuver.

### Carrier Aviation Prospects

Next to its stealth aircraft, the most dramatic expansion of China's airpower comes in the form of its new aircraft carrier.

China purchased the ex-Soviet Union's *Varyag* in 1998 and ultimately towed it from the Black Sea for extensive refurbishment. The 65,000-ton displacement *Varyag* was the second hull of the Kuznetsov class. The carrier put to sea in August 2011.

*Liaoning* was formally christened on Sept. 25, 2012, at a ceremony attended by China's President, Hu Jintao. Senior Col. Zhang Zheng was named as *Liaoning's* first commanding officer. Zhang, age 43, previously commanded a frigate and a guided missile destroyer. He studied English and military doctrine at the Joint Services Command and Staff college in Britain from 2001 to 2003.

*People's Daily Online* in October 2012 reported that Li Jie, a professor at the Marine Military Academy, said the aircraft carrier and their fleets in particular enable the naval force to go farther and conduct maritime surveillance with more efficiency.

As with the stealth programs, there have been major debates about the Chinese carrier. "The most controversial issue of the post-Cold War era has been whether or not China is planning to procure aircraft carriers," wrote Norman Polmar in December 2008.

*Liaoning* differs from the US Navy's Nimitz-class carriers in several ways. Launch operations take place from the primary deck where a 12-degree ski jump lofts fixed wing aircraft into the air. Arresting wires recover aircraft. *Liaoning's* hull was originally designed for substantial self-defense, with automatic deck guns comparable to the Phalanx, vertical launch tubes for long-range air defense, and ship-to-ship missiles.

Full flight operations have not yet been observed. However, a Shenyang J-15 fighter completed a touch-and-go landing drill on *Liaoning* on Oct. 12, 2012, and in late November a pair of J-15s made successful arrested landings before launching again from the carrier. The J-15 is a Chinese-built derivative of the Su-33 designed for carrier operations. China acquired one Su-33 (an upgrade of the Su-27) from Ukraine in 2001. Analysts Phillip C. Saunders and Joshua K. Wiseman from the National Defense



**Gen. Herbert Carlisle (r), commander of Pacific Air Forces, speaks with Lt. Gen. Cai Yingting, deputy chief of the General Staff of the People's Liberation Army, at JB Pearl Harbor-Hickam, Hawaii. Carlisle says China's technology may be 15 years behind the US, but America's stealth advantage is diminishing.**

University expect the J-15 to enter full rate production between 2015 and 2017, which "will give China a capable fourth generation fighter that can be operated from aboard aircraft carriers." The carrier class was originally designed to deploy with some 30 fixed wing fighters and an additional complement of helicopters. That deck mix will add both prestige and local control of the air.

### Net Assessment

NASIC summed up the improvements so far: The PLAAF "is emerging as a well-equipped and increasingly well-trained force, still possessing some identifiable shortcomings and weaknesses."

Significant holes remain in the PLAAF modernization. Foremost among these is its small air refueling fleet. China has perhaps eight Il-78 tankers and may have converted up to a dozen H-6 bombers to refueling status.

Lack of combat experience is also a factor. The USAF pilot force, for example, has long boasted at least a fraction of airmen with combat experience from Vietnam, Operation Desert Storm, etc. Combat experience plus large force exercises season aircrews. The last Chinese pilots to gain combat experience also flew during Vietnam. So far, China's pilots have given no sign that they are gaining skills the way US forces do in Red Flag and other training events. However, they have begun

some international exercises as with the deployment to Turkey in 2010.

What's much harder to assess is the tactical savvy of China's air force leaders from unit to headquarters level. One interesting fact: The preponderance of top officers are fighter pilots, a characteristic that reflects the sheer number of fighter cockpits in the PLAAF since its inception.

Given the forces it's acquiring, China can now combine top equipment and information-focused doctrine into tough tactical problem sets for other forces in the Asia-Pacific region. Geography may still be China's biggest asset because it allows for concentration of forces. China has its entire coastal and inland territory to use as a launching point for fighters, bombers, and support and reconnaissance aircraft. In hypothetical air combat, China will be fighting near home base. The US and its allies, on the other hand, would be reaching to project force—a task that can only be accomplished with backing from tankers, ISR, and air battle control aircraft, all of them far more vulnerable than the fighters and bombers themselves.

US technology may still be 15 years ahead of China's. But that gives little reassurance, especially given the trickle of US stealth aircraft production.

Carlisle put it simply. "We've had an advantage in stealth for a number of years. That kind of time [gap] will not occur again." ■

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