

ANALYSIS: What future for China's air power?

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China's biennial aviation gathering in Zhuhai is among the most exciting shows on the global circuit. The People's Liberation Army Air Force's (PLAAF) August 1st display team has no qualms about roaring above the crowd with their Chengdu J-10A fighters, ejecting flares with every pass. Invariably the Chengdu JF-17, still in search of a buyer beyond Pakistan, will make an appearance, and the Russian Knights will likely be in the air with their Sukhoi Su-27s. With luck, the show, which runs on 11-16 November, will not be afflicted by smog, which restricted the flying displays in 2010, or strong winds, which restricted displays in 2012.

However impressive the displays, the real action for defence experts is in the halls, which hold a staggering array of conceptual models, weapons blatantly imitated from the West, and models of developmental and conceptual unmanned air vehicles. The shoot down of Malaysian Airlines MH17 notwithstanding, there will inevitably be a hall filled with surface-to-air missile systems. Large interactive displays and videos will show how all this firepower will come together seamlessly – and lethally – in networked combat scenarios.

In 2010, one large mural displayed imagery of Chinese aircraft and ground-launched missiles attacking a US aircraft carrier. The US carrier did not make an appearance in 2012, but given recent tensions between Beijing and Washington, it would be no surprise if US forces take another virtual beating at this year's show.

While the show offers a unique glimpse into Chinese airpower capabilities, both real and imagined, it tends to leave many questions unanswered. For China aviation experts, it is generally more notable not for the types of aircraft that are displayed at the show, but for those that are not.



August 1st J-10A at Zhuhai 2012

One type that failed to appear in any form whatsoever at the 2012 show was the Chengdu J-20. Given that this aircraft first flew in January 2011, just six weeks after Zhuhai, its failure to appear in 2012 was not entirely surprising. More surprising, perhaps, was the complete lack of pictures related to the jet or scale models. Whether the J-20 will appear in any form at this year's show is anyone's guess, but even a model of the type will draw significant attention.

In the last two years the J-20 appears to have made a good deal of progress. Flight tests have been ongoing around Chengdu, dutifully observed by local plane spotters, and photos of a fourth prototype bearing the registration number 2012 emerged in June 2014. The two most recent prototypes of the aircraft have a blister under the nose, possibly intended for an infrared search and track (IRST) sensor. There were also refinements to the intakes and modifications to control surfaces.

In 2013 images and videos emerged showing the aircraft flying with the two main weapons bays in its belly open, each capable of carrying two radar guided air-to-air missiles. Other images and videos, breathlessly speculated upon by Chinese enthusiasts, showed its side-weapons bay open. Some footage showed the aircraft carrying a PL-10 short-range IR homing missile, while others showed the extended rail without a missile. One animated video – of questionable origin – suggests the J-20's side missile bays can carry up to three missiles each. Before launch, the door opens and a rail carrying the missile is extended, after which the door closes again. After the round is launched, the rail returns inside the aircraft to collect another missile.

Otherwise, little is known about the J-20 platform, such as the numbers Beijing intends to procure, other variants, or even its eventual missions – although the weapons it has been spotted with thus far suggest aerial superiority is a key focus. Moreover, the perennial problem that faces all Chinese fighters also faces the J-20: engines. The prototypes are believed to be powered by the Saturn AL-31F from Russia, which also powers the J-10 and Su-27. It is also believed that China's indigenous engine, the WS-10, may have been deployed aboard one of the J-20 prototypes, but experts are divided on this.

The J-20's low observable qualities are also open to question. Aside from the challenges inherent in developing and maintaining stealth coatings for combat aircraft, the type's large canards are not consistent with a low-observable design.

Another mystery into which visitors to Zhuhai will hope to gain some insight is China's other "stealth" fighter, the Shenyang J-31. Images of the J-31 first appeared in September 2012. Just two months later a model of the type appeared – without a designation – on the AVIC stand at Zhuhai. When asked about the aircraft, AVIC personnel at the show were noncommittal.

In the two years since its emergence, footage has appeared on social media sites showing the J-31 taking off and flying. It is still not clear if the J-31, which has a more conventional layout reminiscent of the Lockheed Martin F-35, is intended to complement the J-20 or compete with it for a production contract. There is speculation that China would like to develop the type with a foreign partner, possibly Pakistan, or develop it as the key type aboard future Chinese aircraft carriers. Social media suggests the J-31 could appear in the flying display this year, but show organisers or other officials have yet to confirm this.

Daniel Darling, an analyst at research firm Forecast International, underlines the challenges involved in understanding these two programmes.

"Considering both of these platforms are still in development and – due to China's tight control over media and military – not subject to much transparency, it is difficult to discern exactly what the J-20 and J-31 say about China's airpower strengths, except that a safe determination would be that they are not yet quite up to Western standards simply because the [Lockheed Martin] F-22 is in service and the F-35 is now in low-rate production," he says.

"Seen from another angle, China appears going forward to have adopted an approach similar to that of the former USSR – numbers overcome firepower, and the cheaper and easier it is to produce (and operate) hardware the greater chance that any military-technological edge an opponent may have could be eroded."

Darling adds that the scarcity of concrete information about the two types makes it challenging to list the strengths and weaknesses of the types against Western aircraft such as the F-22, F-35, Dassault Rafale, and Eurofighter Typhoon.

“Most indications are that fire-control radars and weapons loads appear 'comparable' to that of US standards,” he says. “Since neither platform has begun full-scale production – and the J-31 is either destined for the export market or carrier-based operations depending on which state-run media outlet is reporting – it is too early to determine the level of gap [depending on if there is one] between, say, the J-20 and the F-22. The J-20 design appears to continually be undergoing refinement as China works on advancing the model.”

Although the future could see PLAAF squadrons kitted out with J-20s and the decks of Chinese carriers covered with J-31s, the mainstay of China’s combat airpower resides in types such as the single-engined Chengdu J-10A and Shenyang J-11, a direct copy of the Sukhoi Su-27. The People’s Liberation Army Navy (PLAN) has also been conducting flight tests with the Shenyang J-15 "Flying Shark", an aircraft all-but-identical to the Russian Su-33, which appeared on the deck of the Soviet carrier Admiral Kuznetsov in the 1980s.

Flightglobal’s World Air Forces directory pegs the J-10 strength at 200 aircraft, and J-11/Su-27 strength at over 300. Of the pair, the J-10 appears to be the key programme for development, filling niches similar to the F-16 in Western air forces. A J-10B variant has been developed with anIRST mounted in front of the cockpit, modified control surfaces and an upgraded engine. This type is likely being rolled out into the fleet. In addition, in 2012, a model of a J-10S twin-seat variant was shown at Zhuhai, featuring a dorsal spine, similar to later models of the F-16, and carrying bombs.

Beijing is also reportedly interested in the Su-35, the most advanced variant of the Su-27 family, but a deal with Russia has yet to be confirmed. Beijing also has a large fleet of older fighters such as the J-7, China’s copy of the Mikoyan MiG-21, and the Shenyang J-8. The World Air Forces directory indicates that China operates 388 J-7s and 96 J-8s.

One notable participant at the last two instalments of the Zhuhai show is the Xian H-6H – based on the Tupolev Tu-16 – long range bomber. The World Air Forces directory shows the PLAAF operating 120 H-6s and the PLAN 14. This type is used for a range of missions, including conventional bombing, cruise missile strike, air-to-air refuelling and intelligence gathering. The H-6H that has appeared at the last two iterations of the show can carry two long-range cruise missiles under its wings. A more advanced variant, the H-6M, has yet to make its appearance at Zhuhai. The H-6M sees the navigator’s station in the nose replaced with a radar, similar to Western bombers, and it has the capability to carry a total of four cruise missiles, giving it twice the armament as previous H-6 versions.



The Xian H-6 fulfills a number of roles, from cruise missile attack to aerial refuelling. Experts will also be looking for models or images that hint at China's supposed plans to build a long-range bomber aircraft. Chinese defence enthusiast sites have been abuzz with rumours and speculation about such a programme for quite a while. If such an aircraft exists, the world's first confirmation will all too likely come from enthusiasts monitoring activity at Chinese aircraft production centres.

Support aircraft, such as transports and airborne early warning & control (AEW&C) will also be a key area of interest at this year's show.

"China continues to emphasise Russian-based models to meet many specific niche capabilities such as AEW&C," says Forecast's Darling. "Its force-multipliers are often derived from Russian technologies or are purchased from Russia directly [example: the Tu-154s converted in the early 1990s for ELINT and electronic-warfare purposes]. This is an area where China has a distinct gap vis-à-vis its strategic rivals to the east [ie the USA and Japan], but it is also part of a longer-term push to reduce the capabilities gap between the West and the PLAAF/PLAN."

Although Zhuhai will no doubt offer some hints about Beijing's future war fighting aspirations, and the kit it wants to sell to overseas buyers, one area where it is unlikely to shed much light on is the most important element in airpower: people.

Although the August 1st team will put on a thrilling aerial display, the team's last minute failure to appear at the Singapore air show in early 2014 raises questions about the professionalism of

the team – and the broader Chinese air force. Sources familiar with the team say it had planned to transit Thailand on the way to the show, but that the PLAAF insisted on its own controllers guiding the aircraft in for landing. In addition, the team apparently demanded extensive air space restrictions be imposed in Singapore before and after their flying display, but this would have disrupted commercial flights at Changi airport. In the end, the team was a no-show.

A far more serious incident occurred in August, when a PLAAF J-11B performed an extremely aggressive intercept of a Boeing P-8A Poseidon operated by the US Navy over the South China Sea east of Hainan Island. During one pass, the J-11B was about 50-100ft (15-30m) from the 737-based patrol aircraft. A Pentagon spokesman described the intercept as “very close, very dangerous...pretty aggressive and very unprofessional.” Some US military officials believe pilots or specific PLAAF units could be acting on their own. The incident conjured up memories of a Shenyang J-8’s collision with a US Navy EP-3E Orion in 2001 during a close intercept. The J-8 crashed and the pilot was killed, but the EP-3E managed to make an emergency landing in Hainan, resulting in a major international incident.

Nonetheless, in recent years Beijing has placed a greater emphasis on training, In September the PLAAF held its fourth annual "Gold Helmet" air combat exercise over the Gobi desert. Official announcements about the exercise indicate that 170 pilots took place in this year’s event, which focuses on air-to-air combat.

For China defence watchers, Zhuhai is an essential. That said, it can raise more questions than it answers. One thing that will definitely be new at this year’s show is the advent of the first female display pilot in the August 1st team. China’s defence ministry has issued a statement declaring this news. Unfortunately its transparency does not extend greatly beyond this.

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