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## **The X-2 ATD-X: Japan's Last Chance Fighter Jet?**

*By Richard A. Bitzinger*

### **Synopsis**

*Japan will soon fly its X-2 fifth-generation fighter jet for the first time, prompting the possibility of a renaissance in the country's aircraft sector. To successfully challenge the West's dominance of the global fighter aircraft business, Japan must synchronise many technological, economic, and political factors, a "harmonic convergence" that is hardly assured.*

### **Commentary**

JAPAN WILL soon achieve something that it has not done since the 1940s – test-fly a totally indigenous fighter jet. In this case, it will be the X-2 Advanced Technology Demonstrator-Experimental (ATD-X), Tokyo's contender for a state-of-the-art fifth-generation combat aircraft.

With the X-2, Japan is seeking to once again contest the long-standing dominance of the advanced fighter jet business by the United States and Europe. Since the end of World War II, a handful of countries – basically, the US, the USSR/Russia, Britain, France, and Sweden – have controlled the global fighter jet industry. Even today, perhaps 90 percent of all combat aircraft flown by all the world's air forces are produced by these five countries, or are based on copies of their planes. In fact, one of the hardest things to do, because it is so intensely and extensively complex, is the design and development of modern fighter jets.

### **Asian Aerospace Ambitions for Combat Aircraft Production**

Many countries have tried to break this monopoly: Argentina in the 1950s, Egypt and India in the 1960s, Israel and South Africa in the 1980s; none were particularly

successful, and some – such as the Indian HF-24 Marut – were spectacular failures. Today, several Asian nations are challenging this traditional Western dominance with a host of new fighter jet programmes, all of which are intended to come into service over the next 10 to 20 years.

India and South Korea have established indigenous aircraft industries and produced hundreds of combat aircraft, but most of these were licensed-produced copies of foreign fighter jets. Both possess ambitious plans when it comes to designing and building homegrown advanced jet fighters, but so far success has been elusive.

On the other hand, some Asian fighter aircraft producers are obviously on the rise. China, for example, has two “fifth-generation” fighter jets in the works, the J-20 and the J-31. Not much is known about these aircraft; the J-20 bears a close resemblance to the US F-22, while the J-31 looks a lot like the F-35 Joint Strike Fighter (JSF). Nevertheless, the existence of both of these programmes certainly demonstrates China’s ambitions – and the aggressive steps it is prepared to take – to claw its way up into the vanguard of fighter-jet producers.

### **Japan’s Hopes for a Revival of its Fighter Aircraft Business**

Finally, there is Japan. For decades, Japan was Asia’s leader in aerospace. It was the only country in Asia that possessed a sizable military aircraft industry before World War II. During the 1920s and 1930s it was a centre of innovation and invention when it came to aviation, and some of its combat aircraft, particularly the A6M “Zero,” were among the best in the world. Destroyed during the war, Japan spent decades rebuilding its aerospace sector.

And yet, even for a technological leviathan like Japan, the country has struggled with its aerospace and aeronautics sector. It has tried and failed several times to develop its own indigenous aircraft, both civil and military. Japan’s most recent homegrown fighter jet, the F-2, has been a technological and programmatic dead-end. Originally, it was supposed to be a true “Rising Sun” combat aircraft, totally indigenous from stem to stern.

Conceived in the 1980s, it was supposed to incorporate the latest technology found in Japan’s highly advanced industrial base, including the heavy use of nonmetal composites and an electronically scanned, phased array radar. However, US political pressure, together with the growing realisation that a totally indigenous fighter was technologically a stretch, forced the Japanese to settle for a hybrid design, one derived from the US F-16, albeit heavily modified and optimized for maritime strike.

Even this more modest programme proved to be a challenge for Japan’s aerospace industry. Structural problems, including cracking in its all-composite and severe flutter, set the programme back years. At the same time, the plane became outrageously expensive, each aircraft costing about three times that of the F-16 on which it was based.

Consequently, procurement was cut from over 200 fighters to 130 to, eventually, just 98 planes. The last F-2 was delivered in 2011, leaving Japan with no fighter

programme in production. In addition, even though Japan is acquiring the F-35, its access to JSF technology will likely be severely limited.

By the mid-2000s, therefore, Japan's aircraft industry faced a crisis of confidence. It had plenty of business, subcontracting for Boeing and Airbus on various commercial airliners, but few aircraft projects of its own. Hence, for the past decade Japan has been quietly working on a fifth-generation fighter aircraft of its own, the X-2 ATD-X. So far, the ATD-X has cost around 39.4 billion yen (around US\$331 million); it will likely fly early this year.

Bear in mind, however, that the X-2 is just a technology demonstrator, not a prototype of a new fighter jet. According to Franz-Stefan Gady of the Diplomat, it is "a testbed platform for multiple technologies," including next-generation electronically scanned array radar, multi-dimensional thrust vectoring, an indigenous low-bypass turbofan engine, and radar-absorbing composite materials.

Production of an "F-3" fighter, based on the X-2 ATD-X, will not begin until 2027 at the earliest. What's more, it is likely that this plane could turn out to be so expensive – it is not inconceivable that a single F-3 could cost US\$200 million or more – that Japan may never buy more than a handful.

### **Needed: a "Harmonic Convergence"**

If successful, the ADT-X/F-3 could shift the centre of gravity in the fighter jet industry from the North Atlantic closer to the Asia-Pacific. If Japan decided to market this fighter to overseas customers – increasingly likely, as Tokyo is quietly watering down its near-total arms export ban – then the F-3 could seriously challenge the West's predominance in this highly lucrative business sector.

That, however, depends on the cosmic alignment of a great many technological, economic, and political factors - a "harmonic convergence" that is hardly assured. Japan, despite all its advantages, will continue to struggle in building and maintaining a state-of-the-art aerospace industry.

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*Richard A. Bitzinger is Senior Fellow and Coordinator of the Military Transformations Programme at the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University, Singapore. This Commentary is based on a recent article by the author that appeared in The Interpreter, which can be accessed here: <http://www.lowyinterpreter.org/post/2016/02/02/Japans-last-chance-fighter-jet.aspx>.*

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