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## **Japan's X-2 Fighter Programme: Continuing Challenges**

*By Richard A. Bitzinger*

### **Synopsis**

*Japan's hopes for using its X-2 Shinshin combat aircraft programme to leap into the forefront the global fighter jet business are increasingly challenged by a variety of technological, political, and economic complications.*

### **Commentary**

JAPAN HAS high hopes for its X-2 *Shinshin* fighter jet, formerly known as the Advanced Technology Demonstrator – Experimental (ATD-X). The plane is the embodiment of many aspirations. It is Japan's first totally indigenous fighter jet since World War II, and it is Tokyo's contender for a state-of-the-art fifth-generation combat aircraft, to compete with the likes of the US F-35 or the Chinese J-20 fighters.

The X-2 is to become the basis for the F-3 Future Fighter Programme. Ultimately Tokyo expects to buy 100 F-3s, at total programme cost (R&D and procurement) of at least US\$40 billion (it will probably be much higher). With the X-2/F-3, Japan is seeking to re-establish its position as being among the leading aerospace manufacturers, with has been long dominated by the United States and Europe.

### **Japan's Post-War Fighter Aircraft Business**

Since the end of World War II, just a handful of countries – the United States, the USSR/Russia, Britain, France, and Sweden – have controlled the global fighter jet industry, accounting for around 90 percent of all combat aircraft flown by all the world's air forces. Japan – together with China, India, and South Korea – are trying to break up this cozy cartel. At the same time, these countries are learning that this is incredibly difficult: few things are more challenging than designing and developing modern fighter jets.

Now, the X-2 is experiencing a familiar pattern for the Asian aerospace sector: a heavily hyped unveiling and first flight, followed by the slow realisation that putting the plane into production is a staggering operation, one perhaps beyond Japan's abilities. Most recently, the programme has been "put back," and a decision on moving ahead with development will not be made until 2019 at the earliest.

For decades, Japan was the centre of Asian aerospace. It was the only country in the region that possessed a sizable military aircraft industry before World War II, and during the 1920s and 1930s it was a centre of aerospace innovation and invention. At the beginning of the war, in fact, the A6M "Zero" was one of the best combat fighters in the world.

After the war, Japan spent decades rebuilding its aviation and aerospace sector. It mostly built US fighters under licence (the F-86, F-4, F-15), and some modest trainer jets.

### **Japan's Struggle for a Fighter Jet**

Yet throughout the 1960s, 1970s, and 1980s, it still struggled to design and develop its own fighter jets.

Over and over, Japan tried – and more or less failed – to build its own indigenous aircraft, both civil and military. Japan's most recent homegrown fighter jet, the F-2, was originally conceived as a "Rising Sun" fighter jet, a totally indigenous aircraft 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.

None of this happened. United States political pressure, plus the growing realisation that a totally indigenous fighter was technologically a stretch, forced the Japanese to scale back their ambitions. The F-2 that eventually emerged was essentially a modified US F-16, kitted out with an all-composite wing and new avionics.

Even this more modest programme proved to be a challenge for Japan's aerospace industry. Structural problems, including cracks in its wing, set the programme back years. At the same time, each F-2 cost about three times as much as an F-16. As the programme progressed, 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. Around the same time, the Japanese Ministry of Defence (MoD) placed an order for 42 F-35s.

### **Enter the X-2**

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 the X-2 fifth-generation fighter. The X-2 hit its first major milestone in 2016, achieving first flight in April of that year.

Nevertheless, the X-2 has a long way to go before it metamorphoses into the F-3 – that is, before it becomes a series-production full-up combat aircraft. The X-2 is just a technology demonstrator; as Franz-Stefan Gady of the *Diplomat* put it, 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.

As such, the X-2 is still basically “a flying box,” lacking the avionics, weaponry, and other systems that constitute a full-up fighter. Production of an “F-3” fighter will likely not begin until 2027 at the earliest. Moreover, 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 buy far fewer than its intended 100 aircraft.

### **Japan’s Uncertain Aerospace Industry**

The X-2/F-3, if successful, could shift the centre of gravity in the fighter jet industry from the North Atlantic closer to the Asia-Pacific. Certainly the Japanese are taking the X-2 seriously, and it has already more than \$330 million on the programme. US aerospace giant Northrop Grumman has indicated its interest in joining the project, which underscores the X-2’s potential as a future cutting-edge fighter jet.

Moreover, if Japan should decide to export this fighter, it might seriously challenge the West’s predominance in this highly lucrative sector.

That, however, depends on a great many technological, economic, and political factors all coming together in a “harmonic convergence”. In fact, there are already rumours that the X-2 is on the chopping block. Although the MoD has denied that it is planning to scrap the programme, it is at the same time looking into buying additional F-35s. Any further delays in the X-2 programme do not augur well.

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