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THE STORY BEHIND THE HEADLINES

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THE NEXT CANUCK FIGHTER

CANADA IS IN the market to recapitalize its multirole fighter force under its Future Fighter Capability Project (FFCP), which aims to begin replacing its aging Boeing CF-188 Hornet fleets from 2025.

On July 31, 2020 the Canadian government confirmed that three companies had formally responded to the request for proposals (RFP), which was released by the nation for its FFCP effort last October.

Boeing's Block III-configured F/A-18E/F Super Hornet, Lockheed Martin's F-35A Lightning II and Saab's JAS 39 Gripen E/F will compete for the much-desired contract. Initially, Dassault Aviation and Airbus Defense were invited to submit proposals, but both withdrew citing high development costs for enabling the aircraft to meet the requirements of NORAD (North American Aerospace Defense Command) and Five Eyes — an intelligence alliance between Australia, Canada, New Zealand, the UK and US.

When the three firms were confirmed to have responded to the RFP, Canada's Minister of National Defence, Harjit S Sajjan, was quick to stress Canada's commitment to the FFCP procurement program. Over the last decade, the nation's attempts at finding a successor to its legacy Hornet fleet proved particularly troublesome.

Sajjan said: "Through our fully-costed and funded defense policy, *Strong, Secure, Engaged*, our government committed to purchasing a full fleet of 88 aircraft to be able to meet our NORAD and NATO obligations simultaneously.

"Efficient and modern fighter jets are an integral part of any air force and we continue to work diligently to make sure that we provide the members of the Royal Canadian Air Force [RCAF] the tools they need to protect Canada, both at home and abroad," he added.

Although each contender for this massive contract boasts dedicated multirole capabilities, they are all noticeably different in design and each offers unique abilities.

Above: On July 31, Boeing released concept art depicting what the F/A-18E/F Super Hornet would look like in Canadian colours. In line with the RCAF's naming tradition, the aircraft has been dubbed the CF-18E by the company. **Boeing**

Continue the Hornet legacy?

Boeing has teamed up with Peraton Canada, CAE, L3 Technologies, GE Aviation and Raytheon to offer its Block III-configured F/A-18E/F Super Hornet to the Maple Nation. A company spokesperson told *Combat Aircraft Journal* that the platform is a "proven, highly-capable aircraft, available at low,

predictable cost that, if selected, would bring guaranteed opportunities to Canadian industry."

The firm boasts that the 'Rhino' – as it is affectionately nicknamed – has been determined by the US government to have the lowest operational flight-hour costs when compared with other in-production fighters.

"The cost per flight hour of an F/A-18, as measured by the US Department of Defense metrics is $18,500 per hour, while the other US competitor is at about $45,000 per hour by those same standards, resulting in sustainment costs that are nearly three times as expensive as the Super Hornet," Boeing's spokesperson added.

A big reduction in long-term sustainment costs would come from the F/A-18E/F's ability to leverage the existing physical and intellectual infrastructure of the RCAF's current CF-188A/B fleets. Opting for the Super Hornet would also provide a low-risk transitional solution for air and ground crews who are already accustomed to the legacy platform, due to the commonality between the aircraft.

The company spokesperson added that the "Block III Super Hornet is affordably built to meet the broad range of mission needs required by the RCAF." Operationally, the F/A-18E/F will be able to conduct cruise-missile defense, all-weather precision strike, close air support (CAS), offensive and defensive counter air, maritime strike and tactical tanker assignments.

Above: A Canadian CF-188A Hornet - serial 188767, belonging to the 401 Tactical Fighter Squadron - is marshalled by ground crew after arriving in Bodø, Norway, for Exercise Trident Juncture in October 2018 **RCAF/Cpl Bryan Carter**

Below: The Block III configuration is the latest version of the F/A-18E/F family. This platform would be the easiest to integrate into the RCAF as it can exploit the existing infrastructure of the legacy Hornets and it shares a lot commonality with its predecessor **Boeing**

Unlike Boeing's ongoing campaigns to export the fighter to Finland and Germany, its offer to Canada does not include the EA-18G Growler electronic attack (EA) aircraft.

In terms of capability, Boeing's spokesperson added that the 'Rhino' is designed to be operated in Arctic and expeditionary environments. Thus, allowing the RCAF to "effectively safeguard Canada and North America, while also adding significant and tactically relevant contributions to coalition operations".

The Block III Super Hornet is the latest configuration of the F/A-18E/F family. Its employment of the new Advanced Cockpit System improves its situational awareness and the inclusion of low-drag conformal fuel tanks increases its overall range. It also features enhanced networking, data-fusion, satellite-communication and signature-reduction capabilities. The firm adds that the F/A-18E/F's airframe life will last for more than 10,000 flight hours.

Alongside this, it is equipped with an infrared search and track (IRST) system, which provides greater long-range detection abilities. Boeing boasts that the IRST has the capability to track low-stealth aircraft at significant ranges, without using its own radar. The 'Rhino' is also able to conduct tactical buddy-buddy refueling with other fighters or attack aircraft, which would enable it to serve as a small-scale force multiplier in RCAF service.

Will Lightning strike?

Lockheed Martin's conventional take-off and landing (CTOL) configured F-35A is one of the most advanced combat aircraft in the world. Development of the Lightning family is the result of large-scale multinational involvement – including Canada, which has been a mid-level partner in the Joint Strike Fighter (JSF) program since 2002.

"The F-35 provides the greatest value proposition," Lockheed Martin's spokesperson told *CAJ*. "[Its] fifth-generation capability far exceeds its fourth-generation competitors.

The stealth capabilities of the F-35 are crucial to keeping Canada secure for years to come, and give Canadian pilots the ability to patrol, monitor and conduct surveillance without being detected."

As a true multirole platform, the F-35A can be operated in both offensive and defensive air-to-air and air-to-ground roles. It is also capable of conducting EA and intelligence, surveillance and reconnaissance roles and is being further developed to expand its suppression/destruction of enemy air defense (SEAD/DEAD) missions.

If selected, Canadian F-35As would feature a drag chute that has already been developed by the company for Norway. It offers a greater degree of interoperability and commonality with other Lightning operators, allowing for allied nations to train, surveil, maintain and operate a common platform together in joint/coalition situations.

"Today, 12 of Canada's closest allies have chosen the F-35, including the UK and Australia. Other nations that will operate the F-35 in the Arctic include the US (Alaska), Norway and Denmark (Greenland). Canada will complete the NORAD/NATO Arctic defence in the face of increasingly sophisticated Russian threats," the spokesperson added.

The F-35 offers a number of unmatched capabilities, when compared with its competitors. It employs advanced stealth characteristics, an integrated avionics suite and innovative sensor-fusion technology, which allows pilots to create a single integrated picture of the battlespace using the aircraft's onboard sensors.

It will also have access to a global logistics support system, which enables operators to plan ahead, maintain and sustain systems over the aircraft's operational lifecycle. If selected, Canadian F-35As would use the Operational Data Integrated Network (ODIN), as opposed to its troubled Autonomic Logistics Information System (ALIS). ODIN is expected to attain full operational capability in 2022 and will replace ALIS on already-delivered aircraft.

The F-35 is still a very new platform, and thus has higher acquisition and operational costs than the other two aircraft competing for the Canadian contract. However, Lockheed Martin anticipates that, as the platform matures over the next decade, operational and sustainment costs will decrease greatly.

In terms of operational affordability, an F-35 in a full combat configuration currently has a cost per flight hour (CPFH) of approximately $40,000. "In partnership with our US and international customers, our goal is to reduce the F-35 [CPFH] to $25,000 by 2025, and we are confident we will achieve this," Lockheed Martin told *CAJ*.

More than 110 Canadian-based companies have participated in the F-35 program. "Canadian industry has been awarded more than $2bn in F-35 development and production contracts to date and is fully embedded in the F-35 global supply chain," the company spokesperson added.

The multirole stealth fighter is currently planned to remain in production until 2046, meaning that Canada's defense industry will benefit from its continued output for years to come. However, it does not need to select the fighter to reap these rewards, as the nation will still be a member of the global supply chain. It is estimated that the program will support 150,000 jobs internationally over its lifespan.

At present the F-35A would be the more expensive choice for Canada, but the company expects its costs to drop in the next five years. It offers a number of advanced capabilities, including stealth, sensor fusion and enhanced networking abilities
Lockheed Martin

A Maple Gripen?

Saab has joined forces with local and international defense firms to offer the Gripen E/F to Canada as it seeks to fulfil its next-generation fighter requirements. Dubbed the 'Gripen for Canada Team', the consortium comprises IMP Aerospace & Defence, CAE, Peraton Canada and GE Aviation. The supplier team comprises Diehl Defence, MBDA and Rafael Advanced Defense Systems.

"Gripen offers state-of-the-art performance and capability that will best support Canada's specific defense requirements in meeting the threats of today and tomorrow," a Saab representative told *CAJ*. "Gripen's fully interoperable and continuously upgradeable design will support Canada in fulfilling all of its NORAD and NATO commitments."

The Swedish-based company is offering both the single-seat Gripen E and two-seat Gripen F to the North American nation. Both variants of the type are currently on order with Brazil and Sweden, with legacy platforms in operational service with the Czech Republic, Hungary, South Africa and Thailand.

Right: Lockheed Martin's F-35A will provide a high degree of interoperability between Canada and other allied operators of the Lightning family in NATO. The aircraft is slated to remain in production until 2046 **USAF/ Ronald Bradshaw**

Below: Saab's Gripen E/F has yet to enter operational service, but the first examples for Brazil and Sweden are currently in production. The firm's offer of localized Canadian production is unique when compared to the other contenders **Saab**

Gripen is the only contender in this program that is not produced by the US, which raised questions about its ability to be modified to meet NORAD's security requirements and maintain Five Eyes interoperability. The company's spokesperson said: "Saab enables our customers to take 'full' responsibility for their Gripen aircraft, including production and development, so that they can install host nation, NORAD and/or Five Eyes-only equipment.

"In summary, Saab's commitment to technology and knowledge transfer provides a NORAD and NATO interoperable fighter solution that will be designed, developed and sustained in Canada, by Canadians."

In terms of capability, the company states that the Gripen is able to meet all of the mission requirements set out by the Canadian government in the RFP. Its open systems design allows the Gripen to be continuously upgraded to accommodate new missions or counter growing threats. It can also be integrated with both US and European-produced munitions. For instance, the platform already employs MBDA's Meteor beyond-visual-range air-to-air missile (BVRAAM) — which is one of the most advanced missiles in use today. The weapon has yet to be fully integrated into the F-35 or F/A-18E/F.

Its open-systems approach also allows for new sensors and systems to be built into the fighter. These already include the new Selex ES active electronically scanned array (AESA) radar, and an IRST system, along with communication datalinks and electronic warfare systems. All of them are fused into and exploited by a combat system that will, according to Saab, "provide the pilot with the ability to dominate, whatever the mission".

Saab's offer of technology and knowledge transfer, with full industrial co-operation means that, if selected, the Gripen E/F fighters will be produced in Canada. Although the other two contenders will help Canadian industry, Saab's will see the majority of the work take place locally. Thus, providing more jobs and enabling the nation to truly tailor the platform to suit its requirements.

According to the proposal, IMP would provide localised production and assembly at its site in Halifax, Nova Scotia, while also providing in-service support throughout the Canadian Gripen fleet's lifecycle. CAE would be responsible for training air and ground crews on the platform and its mission system solutions. Peraton Canada will provide the maintenance, repair and overhaul (MRO) services for the avionics and test equipment, while GE Aviation will produce and sustain the Gripen's engines in Canada.

With acquisition, operational and sustainment costs being heavily factored into Canada's requirements, Saab boasts that the Gripen has attractive lifecycle costs that are of the best value to the Canadian government, air force and taxpayer. The fact that it would also be manufactured in-country will also be to its advantage as it benefits Canada's defense industry.

What next?

Now the proposals have been officially submitted, the three aircraft will be evaluated across three areas: capability (60%), cost (20%) and economic benefits (20%). It will include a phased-bid compliance process, which gives the bidding firms the opportunity to address non-compliant areas of their proposals related to the program's mandatory criteria.

The initial proposal evaluation process is scheduled to conclude by the end of spring 2021. Following which, the Canadian government will choose to enter into talks with two or more of the competing parties and request revised proposals.

After this phase, the government will finalize terms with the producer of its desired platform, before officially awarding the large acquisition contract to one of the three companies. This is expected to take place in 2022, with aircraft deliveries scheduled to begin in 2025 and end by 2032.

Designed in Sweden, the Gripen family has seen continuous operations in Arctic conditions, a proven capability which could strengthen its position in the FFCP program. The fighter has also been offered to Finland in its HX Fighter contest, which boasts similar requirements **Saab**