

INTERNATIONAL
FIGHTER 

THE FCAS PROGRAMME

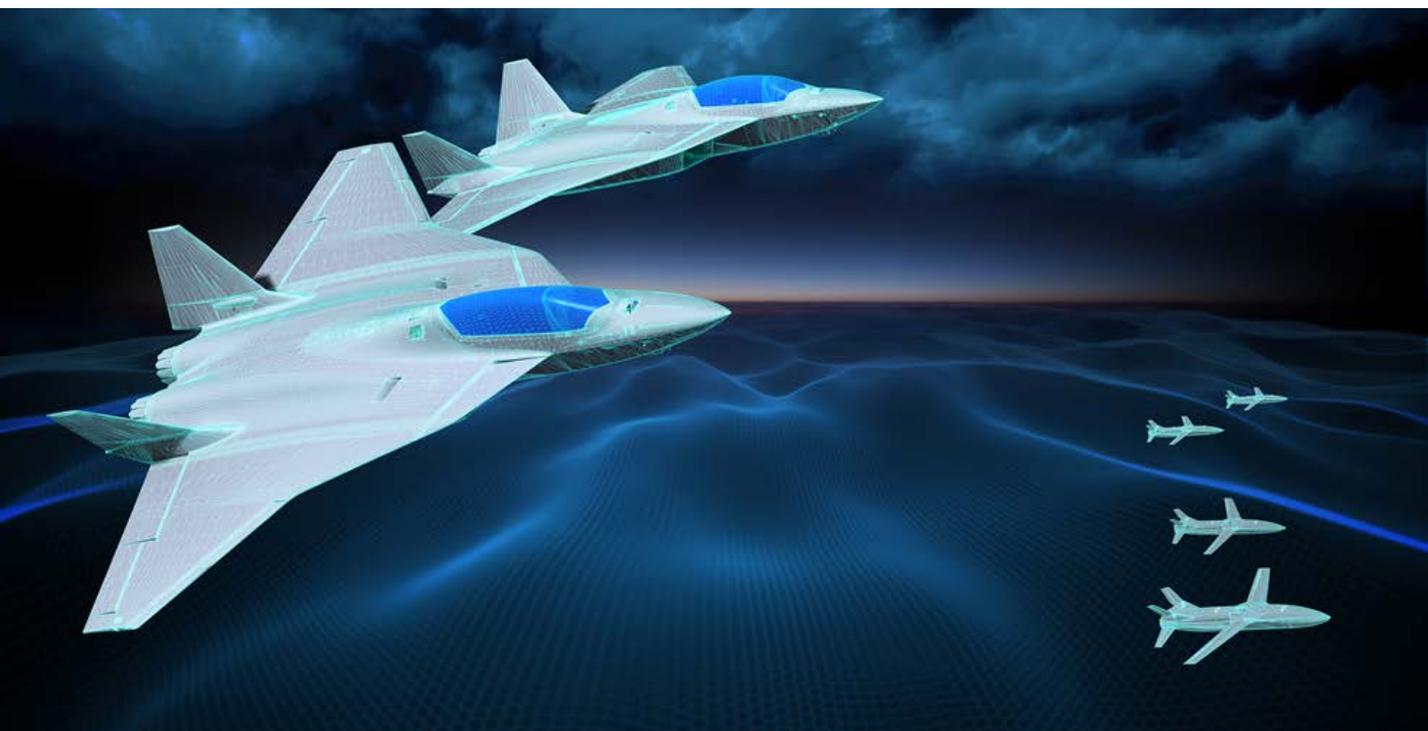
The future of European air combat capabilities?



INTRODUCTION

The Future Combat Air System (FCAS), a collaborative project between Dassault and Airbus, aims to redefine air combat capabilities in Europe. Much more than a fighter aircraft, it is to be a system of systems, a fleet of manned and unmanned systems combined to dominate the airspace in the battlespace of the future.

Ahead of the International Fighter conference this November, we had the opportunity to gain exclusive insight about this project from **Bruno Fichfeux, Head of Future Combat Air Systems at Airbus Defence and Space**. He discusses the overall vision of the project to operate in a post-2035 environment, its next key landmarks, how the system will operate with existing fleets and how industry collaboration will make this project a reality.



DFIQ: Future Combat Air System (FCAS) is dominating Europe's air power headlines right now. Can you take us through your vision for that project, and how you see the partnership with Dassault developing?

BF: The willingness of France and Germany, possibly with other nations, to initiate a joint programme for the FCAS is based on the fact that the current fleet may come to an end around 2060. These countries see an evolution of the threats in different war scenarios where the current systems may not always be able to respond to all of them.

There is a need to replace their fleet and adapt; after analysing the threat, customers and industry, we concluded that the solution is not a super fighter aircraft we replace the current fleet with, but a combination of various assets. The new fighter will be supported by unmanned elements, a whole network, services and communications. The idea is to multiply the effect in the mission and overwhelm the enemy during the battle. This is the reason we call it a system of systems, as it combines different assets that need to be fully integrated together while performing a mission. It will have at its core technologies that are currently emerging and which need to be matured, such as artificial intelligence, autonomy, big data management and advanced networks.

The FCAS in the end should be an information-centric combat system, as the key to winning future battles is a better information management than the

enemy; it is a quantum leap in the area of air combat.

Our working relationship with Dassault is excellent and we agreed to combine both of our competencies as fighter aircraft manufacturers and system house to cover the full spectrum of what the future combat air system will be. Dassault will exercise the leadership in the fighter aircraft and Airbus will cover the unmanned assets, the connectivity, the services and the overall architecture of the programme

"The current systems cannot respond to the evolving threats"

How will the FCAS be equipped to meet the demands of post-2035 air combat?

What will happen beyond 2035 is still unknown. French, German and other European air forces have a view on what the threats will potentially be and the FCAS will be designed according to them. The system will need to be scalable, adaptable and upgradeable to respond to a constantly evolving threat situation and to the change of threats that will happen after 2035.

The various development cycles of all the elements that will build the FCAS need to be considered. The fighter aircraft typically have a 15-20 years cycle, to get

from the very early concept to the operational aircraft and this is why we need to start the discussion on it now. All the other assets' cycles, such as the UAVs and communication standards are shorter. The IT systems and the cyber cycle only last one to two years, which means we cannot design a solution today that will be fully operational in 2035, we need to constantly evolve in an incremental approach. Airbus is pushing for an open architecture approach for the FCAS also in its cyber framework.

Information has become an increasingly significant enabler for global air forces, but the environment in which these aircraft operate makes access to that information increasingly difficult to protect. What is your view on how the future capability balance should look like?

Similarly to the commercial world, we see

that all platforms will be connected in the future, collecting and distributing information. It is a big challenge to ensure information is protected and safely exchanged within the system, which is why we need to build a system that follows robust cyber security standards.

We need to be creative in the design of communications solutions, and Airbus is for example currently working on a laser communication system which is not jammable by design; directional data link is also a topic of high interest for European nations.

We also aim to use the SMART MRTT tanker, which will be present in the air close to the combat area for hours, as a Wi-Fi box and as a communication node in the system. It will enable air forces to exchange information safely between combat aircraft and with other assets of the system.



"2035 seems far away but there are plenty of things to be done beforehand, to de-risk the programme and mature some technologies"

Can you define some landmarks for the project? When will the next substantial development of the project take place?

July 2017 is the first milestone of the project, as that is when President Macron and Chancellor Merkel announced the start of a joint programme between France and Germany. It took a little more than a year for the air forces to define their high level common requirements, which they signed during the Berlin Air Show in April this year. The letter of intent was then signed in June and marked the decision to launch concrete work together. They then defined a joint concept study between the two countries, which is to start at the end of 2018 or beginning of 2019.

The joint concept study is a cornerstone of the FCAS definition and will last two to three years. It is about analysing the mission scenarios of the French and the

German customers, and define which type of concept or solution can respond to their needs. In the end, that solution will not only be based on what the customer missions will be, it will also be defined through simulations, battle lab and analysis of what Airbus and Dassault are presenting.

On top of that, the combined vision from Airbus and Dassault needs to become very concrete quickly. 2035 seems far away but there are plenty of things to be done beforehand, to de-risk the programme and mature some technologies. Our intention is to jointly develop a fighter demonstrator with Dassault to propose to the nations; it should fly in 2025. In parallel, we have plans to jointly develop a demonstrator for a remote carrier UAV, connectivity solutions, for combat cloud capabilities and services, and for a system of systems architecture. Beyond that, there are some technologies that need to be assessed, such as propulsion engines and future data link.



It seems clear that a system of systems approach is key to the FCAS concept. How will this next generation combat aircraft interoperate with existing fleets, UAVS and advanced weapons systems?

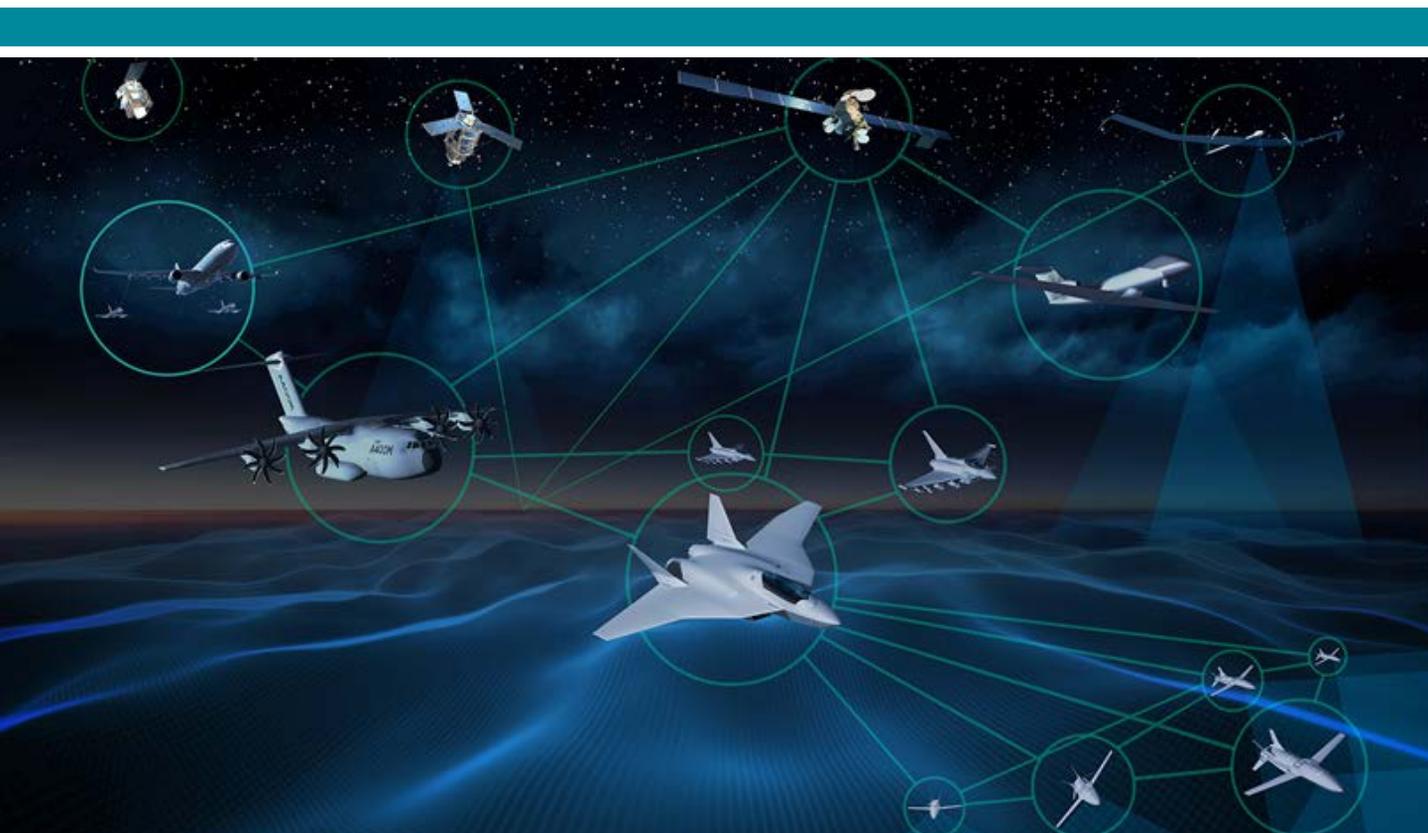
Existing fleets will continue to operate within FCAS beyond the 2035 mark. The expectation for Rafale or Eurofighter is to go beyond 2060, which means that these aircraft will fly together for at least 15 to 20 years. The fighter aircraft will not solely be integrated in this environment; EuroMALE and other key aircraft such as C2 aircraft and MRTT will be operated within the FCAS as well.

As I mentioned before, we want the FCAS to be more than a purely new fighter programme. We want it to set standards for a European architecture and to define

within its protocols and services to integrate all different assets of the participating nations of the programme to enable their own platforms to operate in FCAS. It means that existing fleets will need to be adapted to operate in the frame of FCAS; the Eurofighter roadmap and future standards of Rafale will consider ways to integrate them in FCAS, especially when it comes to communication systems.

Have other European nations agreed to cooperate with the FCAS?

There is a keen interest from many nations and there is a strong willingness from France and Germany to build a common vision and let other nations on board; Spain is looking to be the first one to do so and we hope it will get materialised in the coming weeks.



We need to avoid what happened in the '80s, where we had competing programmes within Europe; this is the worst that can happen to us as it weakens European sovereignty. It also hurts exports as we'll be competing against each other like what is currently happening between Gripen, Rafale and Eurofighter. It is clear we need one solution in the end, but the question for nations is how we come to that.

What will the demands of the project mean for Airbus' collaboration with national and international defence industry?

Let's start with the first step, on the national level. Airbus has both a European positioning and a national one in France, Germany and Spain and it will have a role to play in each of these three nations, to federate, coordinate and manage the local industry during the project. We will need to ensure the adequate positioning, technology roadmaps and competencies to get all the industry supporting air combat in Europe on board.

Internationally, I think Airbus is best positioned, as we are the only truly European company across the different participating nations with an experience of large cooperation programmes. From these, we learned how to work with different contracting agencies, different industries and other companies, where you need to be ready to make compromises and develop processes and

methods to reach joint decisions. Based on past projects, such as Eurofighter, Tornado, space and missile programmes, we now have a clear view on how such a programme needs to be established in terms of governance.

The FCAS programme is by its nature and its ambition enormous, it is one of the biggest European cooperation programmes ever. It will give opportunities to grow, to participate, to develop technologies for the whole industry; the willingness from all these different industry players to share, to collaborate and to make compromises is key. We need to approach this programme from a collaboration point of view rather than competitively.

International Fighter usually gathers a lot of industry solution providers. Do you look forward to meeting companies that offer innovative solutions?

Absolutely, if they work outside the realm of what we already know. We are always happy to exchange and discuss with the ones we already know, even if we have established circles or forums to do this on the FCAS programme.

A conference like International Fighter is always a good opportunity for cross-fertilisation between different industry players. It goes beyond the pure German, French and Spanish perimeter and it is always interesting to see other players' point of view. ■

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4. Improve the training model by blending live and synthetic approaches, and support rapid and effective decision-making for the data-age pilot

5. Support the future delivery of air superiority and ground strike by identifying a next generation combat air blueprint which balances lethality, survivability and stealth

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