THE AVIATION MAGAZINE

www.TheAviationMagazine.com

№ 95 March – April 2025
Volume 16, Issue 2

- Flashback: Hungarian L-39
- Mighty IKES Battle Axe
- Rotray Wing Mission Commander Course
- World Defense Show
- And much more ...

THE AVIATION MAGAZINE

www.TheAviationMagazine.com

№ 95 March – April 2025
Volume 16, Issue 2

Content

Cover: **World Defense Show – Saudi Hawks** *Wolfgang Jarisch*
This page: **Sanicole Airshow 2024 – The Patrouille Suisse** *Joris van Boven*

THE AVIATION MAGAZINE

by www.TheAviationMagazine.com e-mail: editor@TheAviationMagazine.com

THE AVIATION MAGAZINE is published six times a year by a team of volunteers interested in aviation. We are devoted to cover a wide range of aviation events ranging from air shows, air base visits, military exercises, civilian spotting, and pilot and veteran interviews – accentuated with exceptional photography. THE AVIATION MAGAZINE is a leader in the e-magazine format since 2009, bringing exclusive and fascinating reports to our global aviation enthusiasts digitally.

Do you feel addressed and want to be part of our team? We would love to publish your work too, so feel free to shoot us an e-mail to editor@TheAviationMagazine.com. Please note that we do not accept any unsolicited articles or images for publication.

The people behind THE AVIATION MAGAZINE

Publisher & Editor

Ralf Peter Walter
editor@TheAviationMagazine.com

Core Team
Ralf Peter Walter
Wolfgang Jarisch
Peter Thivessen

Occasional Conributors
Juan Miguel Anatol
Igor Bozinovski
Matteo Buono
Kris Christiaens
Joe Cilberti
Davide Daverio
Bruno Etchenic
Rui Ferraira
Simone Gazzola
Ben Gorski
Mike Green / Jetwash Aviation Photos
Manolito Jaarsma
Ralf Jahnke
Paco Jover
István Kelecsényi
Mathias Leischner
Udo Leischner
Mike Lintott-Danks
David Mazón Gómez
Wiebe Karsten
Felix Mayer
Marco Muntz
Matthias Neurohr
Marco Papa
Patrick Roegies
Salvatore Rocella
Danny Reijnen
Anthony F. Seychell
Alessandro Stoico
Gert Trachez
Joris van Boven
Dennis van der Wiel
Alex van Noye
Jorge Ruivo
Martijn Venix
Mika Virolainen
Peter de Vos / Lowpass Aviation
Alistair Zammit / Military Aviation Reachout

FROM THE EDITOR

Dear Readers,

We hope you have had a good start to the New Year and are full of confidence and drive. The Team of **THE AVIATION MAGAZINE** will continue to report on a wide range of military aviation topics in 2025.

In this issue "future" meets "past" - the World Defense Show 2024 in Saudi Arabia and the history of the L-39 Albatros in the Hungarian Air Force. As tensions between Russia and NATO rise, the number of exercises that practice cooperation and interaction between units from different NATO countries is increasing. Read reports on BACCARAT, the visit of the Swedish Air Force with Gripen to the Air Force in Laage, the Weapon Instructor Course and the Rotary Wing Mission Commander Course. Companies such as TOP ACES, which offers advanced airborne training as a service provider, play an important role. This issue is rounded off by a report on the longest ever deployment of the aircraft carrier USS Dwight D. Eisenhower 'IKE' (CVN-69) and its Carrier Air Wing 3 *Battle Axe* and the annual Sanicole Airshow.

For now, enjoy reading our new issue of **THE AVIATION MAGAZINE**.

Ralf Peter WALTER

Publisher & Editor

THE AVIATION MAGAZINE is 100% pure aviation, no advertisements, and absolutely free of charge! It is the BEST and FREE e-based, photo-centric magazine on military aviation since 2009. Imitated by so many, but never surpassed!

PHOTO BY PETER THIVESSEN

BACCARAT 2024

ARTICLE BY
JORIS VAN BOVEN
AND ALEX VAN NOIJE

The exercise BACCARAT 2024 of the French Army (Armée de Terre) and the Aviation Légère de l'Armée de Terre (ALAT) took place at the beginning of October 2024. The exercise was organized by the French 4th Air Combat Brigade (4e Brigade d'Aérocombat, 4e BAC). The exercise consisted of fighting an enemy who had seized an allied country's territory. This scenario is nowadays a very realistic scenario for which troops need to be prepared by training. During this edition of BACCARAT, the focus was on long-distance missions of over 150 km, facing an enemy on equal terms which is very well equipped and well trained. BACCARAT took place in a civilian area in the Grand Est region in Northeastern France. BACCARAT 2024 was a major size exercise for the French Forces with units from all over the country. More than 1,000 soldiers from almost twenty different army units, more than thirty helicopters, and 260 vehicles including 21 armored vehicles took part in the scenarios. BACCARAT 2024 is the first major exercise conducted within the framework of the Deep Action and Intelligence Command (Commandement de l'Action dans la Profondeur et du Renseignement, CAPR) which was founded on 1 August 2024. The extremely rainy weather at the beginning of October pushed men and machines to the test, requiring constant adaptation, making the exercise even more realistic. The start of the development of BACCARAT 2024 started in 2016. The French Army and the ALAT helicopters were already deployed all over the world for many years to fight the Taliban as well as armed terrorist groups in other countries. The units have been engaged without interruption for more

On 4 February 2025, the French Army received its final NH90 Caïman tactical helicopter, replacing the Aérospatiale SA 330 Puma

than twenty years in all theaters of operation. While many hardened conflicts are developing all over the world, it is then noted that certain know-how related to high intensity, taught in training schools, is no longer practiced in current army units. These are exercises and training such as combat in large helicopter formations or flying in heavy ground-to-air threat conditions. The BACCARAT exercise was launched in 2017 in response to the lack of such training opportunities. Since then, each edition of this exercise has made it possible to conduct training focused on this specific know-how, systematically associating many capabilities of the French Army, but also using the knowledge of the Air and Space Forces (Armée de l'Air et de l'Espace, AAE).

In addition to consolidating the brigade's combined arms skills and know-how, by integrating many non-BAC units, particularly foreign ones, BACCARAT 2024 aimed to plan, coordinate, and conduct actions in the depth of the battlefield, in joint forces, in a high-intensity framework against a hardened enemy. Specific tactical sequences were therefore set up in cooperation with the Air and Space Force as part of the missions to destroy enemy ground-to-air capabilities. The exercise also aimed to strengthen 3D coordination, marking a particular effort on drone-helicopter cooperation, in particular through the work conducted with a Puma drone detachment from Great Britain of the 61st Artillery Regiment, which is implementing the SMDR2 (Mobile Detection and Intelligence System Generation 2). In order to be prepared for an exercise of this magnitude, preparations have been underway for at least a year in advance. The exercise took place on civilian ground, particularly in the middle of civil air navigation. Therefore, numerous authorizations had to be requested and to prepare everything in sufficient detail. This is a must as the actions have to be carried out in conditions as close as possible to real-life engagement situations. Also, it is necessary to build a complete, ambitious, and realistic exercise scenario, so that all participants can be truly immersed and therefore can train maximum effectively. Finally, this type of exercise allows for the participation of a large number of military units. It is therefore necessary to ensure that each of them can train specifically while contributing to the training of the other units. The preparation for this is one big puzzle of interests of the future participants and every single piece of the puzzle needs to fit easily.

BACCARAT 2024 was an important milestone in the preparation of the DIODORE exercise which will take place in March 2025. This is the first exercise of the newly created Command of Actions in Depth and Intelligence (Commandement de l'Action dans la Profondeur et du Renseignement, CAPR). The objective

The NH90s participating in the exercise were assigned to 3rd Combat Helicopter Regiment (3e régiment d'hélicoptères de combat, 3e RHC) which is based at Etain-Rouvres

of this exercise, within the framework of operations in the depth of the battlefield, is to shorten the intelligence-decision-fire loop, by seeking to integrate all contributing functions within a common staff. The Air Combat Brigade (Brigade d'Aérocombat, BAC) will of course participate, providing staff personnel in particular, but also its command, transmission, and air combat support company. The year 2024 marked the integration of the BAC within the CAPR. After several years of reflection and experiments on combat in the depth of the battlefield, this represents a new opportunity for the BAC to work with the players of the new CAPR brigades. These players are the Cyber Electronic Intelligence Brigade and the 19th Artillery Brigade. In addition, the BAC was also reinforced with the arrival of the 9th Airmobile Support Regiment (9e Régiment de Soutien Aéromobile, 9e RSAM) from Montauban on 1 January 2024. As usual, many phases that had been planned in preparation could not be conducted, particularly due to the extremely bad weather, which was quite capricious. But that is exactly why the exercise staff prepared these types of exercises in detail; it allows the units to adapt the phases much more easily when their conduction is disrupted. In the end, the units of the 4e BAC were very satisfied with the results achieved. The goals that were set at the beginning were achieved. It was also possible to clearly identify what did not work well, which is also a satisfaction. After a detailed analysis, the French Army will be able to take corrective measures and do even better next time.

BACCARAT 2024

The exercise BACCARAT 2024 of the French Army (Armée de Terre) and the Aviation Légère de l'Armée de Terre (ALAT) took place from the beginning in October 2024. The exercise was organized by the French 4th Air Combat Brigade (4e Brigade d'Aérocombat, 4e BAC). The exercise consisted of fighting an enemy who had seized an allied country's territory. This scenario is nowadays a very realistic scenario for which troops need to be prepared by training. During this edition of BACCARAT, the focus was on long-distance missions of over 150 km, facing an enemy on equal terms which is very well equipped and well trained. BACCARAT took place in a civilian area in the Grand Est region in Northeastern France.

BACCARAT 2024 was a major size exercise for the French Forces with units from all over the country. More than 1,000 soldiers from almost twenty different army units, more than thirty helicopters, and 260 vehicles including twenty-one armored vehicles took part in the scenarios. BACCARAT 2024 is the first major exercise conducted within the framework of the Deep Action and Intelligence Command (Commandement de l'Action dans la Profondeur et du Renseignement, CAPR) which was founded on 1 August 2024. The extremely rainy weather at the beginning of October pushed men and machines to the test, requiring constant adaptation, making the exercise even more realistic. The start of the development of BACCARAT 2024 started in 2016. The French Army and the ALAT helicopters were already for many years deployed all over the world to fight the Taliban as well as armed terrorist groups in other countries. The units have been engaged without interruption for more than twenty years in all theaters of operation. While many hardened conflicts are developing all over the world, it is then noted that certain know-how related to high intensity, taught in training schools, is no longer practiced in current army units. These are exercises and training such as combat in large helicopter formations or flying in heavy ground-to-air threat conditions. The BACCARAT exercise was launched in 2017 in response to the lack of such training opportunities. Since then, each edition of this exercise has made it possible to conduct training focused on this specific know-how, systematically associating many capabilities of the French Army, but also using the knowledge of the Air and Space Forces (Armée de l'Air et de l'Espace, AAE).

In addition to consolidating the brigade's combined arms skills and know-how, by integrating many non-BAC units, particularly foreign ones, BACCARAT 2024 aimed to plan, coordinate, and conduct actions in the depth of the battlefield, in joint forces, in a high-intensity framework against a hardened enemy. Specific tactical sequences were therefore set up in cooperation with the Air and Space Force as part of the missions to destroy enemy ground-to-air capabilities. The exercise also aimed to strengthen 3D coordination, marking a particular effort on drone-helicopter cooperation, in particular through the work conducted with a Puma drone detachment from Great Britain of the 61st Artillery Regiment, which is implementing the SMDR2 (Mobile Detection and Intelligence System Generation 2). In order to be prepared for an exercise of this magnitude, preparations have been underway for at least a year in advance. The exercise took place on civilian ground, particularly in the middle of civil air navigation, therefore numerous authorizations had to be requested and to prepare everything in sufficient detail. This is a must as the actions have to be carried out in conditions as close as possible to real-life engagement situations. Also, it is necessary to build a complete, ambitious, and realistic exercise scenario, so that all participants can be truly immersed and therefore can train maximum effectively. Finally, this

type of exercise allows for the participation of a large number of military units; It is therefore necessary to ensure that each of them can train specifically while contributing to the training of the other units. The preparation for this is one big puzzle of interests of the future participants and every single piece of the puzzle needs to fit easily.

BACCARAT 2024 was an important milestone in the preparation of the DIODORE exercise which will take place in March 2025. This is the first exercise of the newly created Command of Actions in Depth and Intelligence (Commandement de l'Action dans la Profondeur et du Renseignement, CAPR). The objective of this exercise, within the framework of operations in the depth of the battlefield, is to shorten the intelligence-decision-fire loop, by seeking to integrate all contributing functions within a common staff. The Air Combat Brigade (Brigade d'Aérocombat, BAC) will of course participate, providing staff personnel in particular, but also its command, transmission, and air combat support company. The year 2024, marked the integration of the BAC within the CAPR. After several years of reflection and experiments on combat in the depth of the battlefield, this represents a new opportunity for the BAC to work with the players of the new CAPR brigades. These players are the Cyber Electronic Intelligence Brigade and the 19th Artillery Brigade. In addition, the BAC was also reinforced with the arrival of the 9th Airmobile Support Regiment (9e Régiment

The NH90 has a cruise speed of 300 km/h and a range of 880 km or 1,600 km in ferry configuration. Its service ceiling is 3,500 m. It is equipped with rappel systems, fast-roping points, a rear ramp, and provisions for door-mounted machine guns

de Soutien Aéromobile, 9e RSAM) from Montauban on 1 January 2024. As usual, many phases that had been planned in preparation could not be conducted, particularly due to the extremely bad weather, which was quite capricious. But that is exactly why the exercise staff prepared these types of exercises in detail; it allows the units to adapt the phases much more easily when their conduction is disrupted. In the end, the units of the 4e BAC were very satisfied with the results achieved. The goals that were set at the beginning were achieved. It was also possible to clearly identify what did not work well, which is also a satisfaction. After a detailed analysis, the French Army will be able to take corrective measures and do even better next time.

NH90 Caïman HMA (3e RHC)

A Maneuver and Assault Helicopter (Hélicoptère de Manœuvre et d'Assaut, HMA) like the NH90 Caïman has a wide variety of missions for which it can be conducted. The NH90 Caïman helicopters involved in the exercise were from the 3rd Combat Helicopter Regiment (3e régiment d'hélicoptères de combat, 3e RHC) which is based at Etain-Rouvres. The helicopters that were deployed during the BACCARAT exercise were used for many different tasks. The helicopters were mainly used for 'heliport missions'. The objective here is to drop troops that can be engaged as soon as they land as close as possible to an enemy objective in order to seize it whether it is a building, an individual, or a group of vehicles. Landing on enemy terrain can be done in several ways, either by dropping the troops directly on the ground or, when the landing area is too small, by using the fast rope technique with the helicopter hovering above its target. The second type of mission is an 'extraction mission'. These missions consist of extracting personnel or equipment from a non-permissive zone, possibly under enemy fire. It is important to execute these missions rapidly and with high precision. The third mission for which the Caïman was used in BACCARAT was setting up FARPs (Forward Arming and Refueling Point). This task consists of setting up a refueling point for ammunition and kerosene for other helicopters that are deployed in the mission to increase their autonomy or endurance. The Caïman will bring equipment by air to this FARP location for setup. Finally, the Caïman is also used for so-called 'DHIG missions' which stands for Détachement Héliporté d'Intervention du Génie (Helicopter Intervention Detachment of Engineers). It consists of mining with anti-tank mines, making roadblocks with the help of engineer sections to slow down or block an enemy force from using the road. The NH90 is the most recent HMA in the French Army. Compared to other HMAs, it has a major technological advantage: a mapping system to find its way in space with a head-up vision system that is connected to the "TopOwl" helmet. This system allows the pilot to have all the flight information like speed, power, altitude, heading, etc. displayed in the visor without having to look at the instruments. The NH90 has also high-performance detection and countermeasure systems to protect against enemy defenses and it has a rotor blade de-icing system to be able to fly in clouds in icing conditions. The helicopter has significantly increased "physical" and mechanical capabilities like its Safran engines with more than 2,000 hp which allow it to operate at high temperatures, at high altitudes, and at high speeds of almost 300 km/h. The Caïman has a carrying capacity of 20 personnel in the hold, a maximum weight of 10.6 tons to transport men or equipment and it has electric flight controls which provide very high responsiveness in piloting the machine.

Every flight with the NH90 necessarily begins with the preparation of the mission. This begins with the reception of orders, the reflection on the mission (routes, schedules, administrative procedures, risks, and palliative solutions, etc.). After that, the briefing will start which aims to inform the members of all the crews about the flight which is going to be carried out. These briefings are very important and must leave no room for doubt. The flight will start with the checks of the aircraft until start-up, the boarding of the personnel in the hold, and then, the flight itself. During the flight, there will always be several phases: the flight towards the objective (generally in tactical flight, and close to the ground), the reconnaissance of the landing zone and the landing itself, and finally, the returning trip. Once the mission is carried out, the crew systematically proceeds to the debriefing. The flight is reviewed as a whole, to note the positive points and the things to improve. Everyone speaks freely. The goal is to use this feedback to progress and not repeat the same mistakes if there have been any. In the event of an instructive event (flight failure, particular tactical situation, etc.), feedback can be given to the entire squadron so that it is beneficial to all pilots. In an operational context, the landing zone must provide security and safety. Flight Safety

The NH90 is an 11 ton twin-engine helicopter developed for battelfield transport, MEDIVAC, and airborne operations

is mainly in relation to the terrain and obstacles like power lines, excessive slope, size of the landing zone, and the nature of the ground. Tactical safety is in relation to the enemy. The landing zone must be close enough to the objective to act without endangering the crew. In the context of training, pilots take very strongly into account the notion of nuisances for the civilian population, the landing zone must therefore be at a good distance from homes and animals.

In operations in exercises like BACCARAT, it is very rare for a maneuver and assault helicopter to move without cover. Generally, the formation moves at least in patrol with three helicopters. Mostly two HMA like an NH90 or a Puma and one HRA like the Tigre or a Gazelle. The HRA ensures protection during the set-up but also secures the landing zone and its environment before the troops are disembarked after landing. From a tactical point of view, landing, and take-off are the critical phases for a helicopter when landing in an enemy zone. The helicopter moves at low speed and at low height, which makes it an easier target (to get hit by enemy fire). If it is also required to disembark or embark personnel, the helicopter will have to remain motionless on the ground for the duration of the maneuver. This is also the phase where the crew is highly concentrated because it is the most critical moment in the event of a mechanical failure. It is about overcoming these vulnerabilities that pilots train daily in order to know how to react quickly and effectively if necessary and to restrict this "critical" phase to a minimum. The number of helicopters that can land in one landing zone at the same time will depend on the size of the landing zone. The larger the area, the greater the number of helicopters. In simple terms, there must be a spacing of one rotor diameter between each helicopter and the obstacles in order to land simultaneously. It is still rare that ALAT units land more than six helicopters at the same time in the same area. Most tactical scenarios require fewer helicopters for the mission.

SA342 Gazelle with Mini-guns (3e RHC)

One of the most extraordinary configurations seen at BACCARAT were the Gazelle helicopters which were equipped with a huge door-mounted Mini-gun. The gazelles in the exercise were from Etain-Rouvres and belong to the 3rd Combat Helicopter Regiment (3e régiment d'hélicoptères de combat – 3e RHC).

The Gazelle Gatling configuration is an evolution of the Gazelle SA342 (Ma or M1 version). The original helicopter is slightly modified to accommodate the M134D machine gun on board and allow the gunner to use it easily. The M134 Mini-gun is an American with a high rate of fire of 2,000 to 6,000 rounds per minute. The gun features a Gatling-style rotating barrel assembly with an external power source, normally an electric motor. The "Mini" in the name is in comparison to larger-caliber designs that use a rotary barrel design, such as General Electric's earlier 20 mm M61 Vulcan, and "gun" stands for the use of rifle ammunition as opposed to autocannon shells. Even old equipment, such as the SA342 Gazelle, continues to evolve in order to adapt to new types of missions

A SA342 Gazelle with 7.62×51mm NATO standard six-barrel rotary machine gun (Mini-gun). The Gazelles taking part in BACCARAT 2024 were from the 3rd Combat Helicopter Regiment (3e régiment d'hélicoptères de combat – 3e RHC) at Etain-Rouvres

that are demanded on the modern battlefield. In the case of the "Gazelle Gatling", as the crews describe it, the need had already been identified for several years for such a weapon onboard an ALAT helicopter. The idea for this concept in France was reinforced by the observation of the use of comparable capabilities in other armies in NATO. This new asset gives this "lady of a respectable age" a whole new function within the ALAT. With this version of the Gazelle, several types of missions are possible, like: fire support for neutralization or destruction, harassment like warning shots or just a show of force, as well as mainly defensive missions like interdiction, covering, and braking. The ALAT here has a capacity gradation in the use of force which is very interesting to respond to rapidly changing situations. The weapon platform will mainly be used against enemy installations like the dismounted light infantry type and light armored vehicles. Favorable, and much more shown than in the exercise, the excellent real results of this weapon system are demonstrated in the feedback of the crews. They love its significant saturation capacity, precision, its close range capacity, and the weapon has a notable psychological impact.

Eurocopter EC665 Tigre HAD (5e RHC)

The Eurocopter EC665 Tigre HAD version (Support & Destruction Helicopter – Hélicoptère d'Appui Destruction, HAD) is an attack helicopter of the French ALAT. The helicopters involved in BACCARAT 2024 are assigned to the 5th Combat Helicopter Regiment (5e Régiment d'Hélicoptères de Combat,

SA342 Gazelle assigned to 3e RHC equipped with a Mini-Gun

5RHC). The 5e RHC has been based in Pau since September 21, 1984, in the "Chef d'Escadrons de Rose" district which is its current location. The Tiger HAP is a medium-weight air-to-air combat and fire support helicopter built for the French Army. The main role of the helicopter within the ALAT is to support allied troops. This can be done by fire (Destruction), but also by delivering intelligence, or even by its simple presence in the area, which is dissuasive depending on the enemy threat. The Tigre is able to deploy a wide range of weapons, which makes it indispensable in all theaters of operation today, and becomes a real force for headquarters and decision-making centers. The helicopter is fitted with a chin-mounted GIAT 30 mm gun turret and can carry 68mm SNEB unguided rockets or 20 mm machine cannons for the fire support role as well as Mistral air-to-air missiles if needed. The Tiger is a system that was specifically built for the French armed forces, which means that it was designed to integrate optimally with other army equipment. To communicate with ground troops, but also other units at land in the air or at sea, it is equipped with different radio stations that operate on a wide range of frequencies. Clear and descent communication is key to use the Tigre in strength as an extension of the other army units. In the Tigre, the crew is made up of a pilot who is in charge of piloting and ensuring the immediate safety of the helicopter, and a captain, who is also called a "Gunner", who manages the mission, navigation, radio communications and the delivery of fire power. The Gunner is therefore in charge of the helicopter and decides whether to use a weapon or not. Depending on his mission, the orders he receives, the threat he faces and his assessment of the situation, the Gunner must make a difficult choice and decide whether or not to use his weapons. All crews train to best deal with this type of situation during an exercise like BACCARAT.

Eurocopter EC665 Tigre HAD assigned to the 5th Combat Helicopter Regiment – 5e Régiment d'Hélicoptères de Combat – 5e RHC) at Pau

The EC665 Tigre HAD is fitted with a chin-mounted GIAT 30 mm gun turret

FLASHBACK

HUNGARIAN L-39 *ALBATROS*

ARTICLE BY ISTVÁN KELECSÉNYI

The Hungarian Air Force L-39ZO '119' lands on the runway of Kecskemét AB. The aircraft was given a special color scheme for the 2005 Kecskemét International Aviation Day and named "Zümi" (Wasp). The picture was taken afterwards on a training day in Kecskemét on 14 November 2005

THE HISTORY OF THE L-39ZO *ALBATROS* TRAINING AIRCRAFT IN HUNGARY.

From 1 December 2009 to 30 June 2010, eight L-39ZO *Albatros* training aircraft of the type L-39ZO *Albatros* were withdrawn from the Hungarian Defence Forces from the Wasp "Dongo" Squadron of the Vitéz Szentgyörgyi Dezső Airbase in Kecskemét.
The official farewell flight of the aircraft took place on 25 November 2009, attended by Dr. Imre Szekeres, Minister of Defense, and László Tömböl, Chief of the Army

LZ-39ZO Withdrawl Ceremony on 25 November 2009 at Kecskemét AB
Main Four-ship flyby of *Albatros* trainer aircraft. The formation leader is L-39ZO '119' followed by two L-39ZO side number 136 and 128. The rearmost is the Czech Aero Vodochody L-159B training aircraft, leased by the Hungarian Air Force for pilot training. Left Static display of the three L-39ZO of the formation Middle L-39ZO '136' taxiing Right L-39ZO '119' after the completion of the formation flight.

General Staff. The farewell flight was attended by the active and retired technical and naval personnel of the aircraft squadron, commanders, pilots, maintenance staff, technical operators, and representatives of the invited media.

The L-39 *Albatros*, a two-seat, jet-powered trainer aircraft, was developed in Czechoslovakia in the 1970s for basic pilot training, aerobatic exercises, and combat elements, replacing the L-29 Delfin, also of Czechoslovakian manufacture Aero Vodochody. Hungary did not purchase any jet training aircraft after the withdrawal of the L-29 *Delfin* in 1984, and training of military fighter pilots was carried out abroad in the Soviet Union, Poland, and Czechoslovakia.

The L-39 *Albatrosses* were part of the ZO variant. The first ZO took to the skies on 25 August 1975 as the X-09. The aircraft was designed for training future pilots of MiG-21 fighter aircraft, and much of its onboard equipment is identical to the radio equipment of the Russian fighter aircraft. The KVANT rangefinder, SPU-9 on-board transceiver, MRP-56 marker receiver, SRO transponder, RV-5 altimeter, and R-832M radio were installed. The aircraft was equipped with an RKL-31 radio compass and a KXP-756 transponder. It was not equipped with an integral barreled firearm, unlike the ZA variant which carries a Gsh-23mm twin-barreled machine gun under the fuselage. Such aircraft have been used, for example, by Romania and the Czech and Slovak Republics. The ZO modification is also not unarmed as it has two or two weapons hardpoints under its wings, each with a payload of 250 kg. It can carry up to four UB-16 unguided missile containers (64 S-5 missiles in total), eight 125 kg or four 250 kg or two 400 kg bombs, two 350-liter spare tanks, and two R-3Sz infrared-guided air-to-air missiles in various configurations. The aircraft can also be equipped with a reconnaissance pod.

A total of 394 ZO variants were built between 1975 and 1985. Of these, 50 were purchased by the former GDR, 81 by Iraq, 181 by Libya, and 55 by Syria. Syria later delivered ten to Egypt.

The history of the L-39ZO in Hungary began after the German Reunification when the German government donated twenty-four *Albatros* aircraft from the former German Democratic Republic to Hungary in September 1993. These aircraft and the Jak-52 propeller-driven trainer aircraft purchased from Romania were used to restart fighter pilot training in Hungary. The L-39ZO aircraft were produced in Czechoslovakia between March and May 1978 and underwent major overhauls between 1987 and 1989. The *Albatros* had an average of 1,500 flying hours before they were delivered to Hungary. They were delivered in containers and assembled and fitted with systems by the Dunai Aircraft Factory. Twenty of the aircraft, nicknamed "Alba", were put into service, the remainder

L-39ZO '119' and '128' in the central zone of Kecskemét AB on a NATINEADS (NEW FIP) electronic warfare exercise on 28 April 2004

being spare parts or aircraft that never entered service.
The L-39ZOs were painted in a similar grey-green and dark sand-yellow color scheme to the MiG-21 fighters in service at that time, and a yellow stripe was painted on the top of the vertical tailplane and on the wingtips to indicate the training version. The last three digits of the original factory number were painted red on both sides of the nose section. The wedge-shaped supersign was painted on both sides of the vertical tailplane and the upper and lower wing tips.
The first flight of the aircraft with the side number 131, which was completed at the factory of Dunai Repülőgépgyár Rt., was on 3 March 1994, when the L-39ZO with the new wedge-shaped Hungarian registration mark was flown for the first time.
The first L-39ZO landed at the Kecskemét base on 20 April 1994, and on 21 March 1995, the students of the Szolnok Flying Officer College started their practical flight training. On 25 July 1995, the "Alba", side number 139, with Majors Gyula Molnár and János Németh on board, made a flight near Abony, when the AI-25TL engine of the aircraft stopped. The investigation revealed that the engine shaft was slightly deformed under heavy overload and the turbine rotor blades touched the turbine casing wall. As a similar problem had occurred elsewhere, the manufacturer was involved in replacing the engines in the fleet with a version that would not have to be replaced in the future.
From 1996, organizational changes took place, the training company officially became part of the 59th Szentgyörgyi Dezső Base in Kecskemét, the "Winged Stallions" became the third unit, along with the Puma and Wasp squadrons.
On 14 June 1997, the engine of L-39ZO No. 120 failed in flight. Major István Guti and Captain Zoltán Peszeki did not eject but attempted to restart the aircraft. This was successful at an altitude of 50 meters, after which they landed without further trouble.
In 1998, the mandatory second industrial overhaul of 12 of the 20 L-39ZO aircraft was carried out by Dunai Repülőgépgyár Rt. under the supervision and with the assistance of Aero Vodochody.
The Hungarian aircraft were not armed and could only be used for pilot training under an agreement with the German government. During the overhaul, the suspension points on the aircraft were rewired and then the UB-16-57 unguided missile containers, which were also used on the Mi-8 and Mi-17 helicopters and the MiG-21MF fighter aircraft, could be fitted to the aircraft. No other types of armament were purchased for the L-39ZO *Albatros*. During the overhaul, the Kvant rangefinder was removed from the aircraft, which was of little use. GPS and NA-

L-39ZO '114' af Kecskemét AB during a NATINEADS (NEW FIP) electronic warfare exercise on 28 April 2004

TO-compatible IFF systems were also installed. The aircraft were repainted and the yellow stripes indicating the training version were no longer on the control surfaces.

From 1994 until its withdrawal, 120 pilots flew at least an hour in the first seat of the *Albatros*, and the aircraft have logged nearly thirteen thousand hours in the air over the last fifteen years.

In addition to training flights, the *Albatros* have represented the Hungarian Air Force in static and dynamic demonstrations at the Kecskemét, Szentkirályszabadja, and Szolnok flying days in Hungary, on national holidays such as over Budapest or Szolnok, and at flying days abroad. Of the aircraft, the 119 and 135 were given special liveries. The 119 Alba received its first livery for the Kecskemét International Aviation Day 2005. Its wasp painting christened "Zümi" has been highly acclaimed and the Air Force has been invited to several foreign airshows with this aircraft. Unfortunately, the aircraft was repainted in air superiority grey. For the next flying day, however, two *Albatrosses* were painted as Cápeti and Cápali, after characters from a popular cartoon series to celebrate the 70th anniversary of the Hungarian Air Force.

Lt-Col András Janicsek and Lt-Col Zoltán Ignácz died in 2008 when their L-39ZO with side number 120 crashed near Fehérgyarmat.

The L-39ZO *Albatros* had reached the end of their calendar service life by the end of 2009, and their overhaul was considered uneconomical because the aircraft's instrumentation was not suitable for conversion to the modern fourth-generation JAS-39 Gripen aircraft. The military leadership therefore decided to withdraw the aircraft. No new aircraft were planned in the jet trainer category, but the absence of the *Albatrosses* meant a loss of about 1,000 flight hours that could not be replaced by the aircraft types in the system.

One of the possible successor types at the time was already available to the country in 2007. The L-159B ALCA (Advanced Light Combat Aircraft) 6066 two-seat prototype of the Aero Vodochody L-39 aircraft, with a redesigned larger combat-grade US engine, substantial armament, on-board multirole locator, and a modern cockpit suitable for Gripen training, was flown on lease in Hungary. Pilots returning from flight training in Canada were keen to fly the L-159B in Hungary, but at least three more were needed to fly the required number of hours.

Top right Two L-39ZO *Albatros* trainers taking off at the Kecskemét International Aviation Day on 6 July 2005

Above L-39ZO 114 landing at Kecskemét AB on 28 April 2004

The Hungarian Air Force also briefly had a demonstration squadron of *Albatrosses* in 1997 and 2003, consisting of highly experienced instructor pilots. The aircraft belonged to the 3rd Winged Stork Reconnaissance and Training Squadron of Kecskemét AB. The aircraft were not given a special livery. The pictures were taken on the International Aviation Day 2003

The problem was that, apart from the prototype, it was extremely reliable. The L-159A single-seat aircraft had been rebuilt as a new two-seat trainer aircraft. The prototype of this aircraft was completed as the L-159T1 and four of them were put into service by the Czech Air Force. The T1's combat capability is reduced compared to the original L-159A and B versions, for example, it does not have a Grifo locator, but it is suitable for training purposes, with a simulator imitating the operation of the locator in the aircraft.

At the 2009 farewell ceremony at Kecskemét Air Base, the Minister of Defence was received by a military salute from the squadron of honor, followed by a flight of the Szentgyörgyi Dezső Air Base's aircraft, which included an AN-26 transport aircraft, three L-39ZO *Albatros*, two JAS-39C *Gripen*, a MiG-29B and a MiG-29UB. They were followed by Aero Vodochody's L-159B ALCA aircraft.

Following the solo aerobatic flight of the L-159, a flotilla of aircraft flew over the heads of the invited guests. The first *Albatros* was followed by the AN-26, the second by two MiG-29s, and the third by two *Gripen*. The dynamic display was rounded off by a foursome of *Albatrosses* and ALCA.

The three L-39ZO *Albatrosses*, making their last take-off, rolled to the "blue" repair hangar, crowded with guests, after landing. The engines of the aircraft, painted "1994-2009", with side numbers 136, 128 and 119, were silenced simultaneously. Lieutenant Colonel Géza Takács, commander of the Wasp Squadron, reported to the Minister of Defence: "Mr. Minister, I report! The L-39 ZO trainer aircraft has completed its farewell flight."

The dynamic presentation was followed by ceremonial speeches by the Minister of Defence and the Com-

L-39ZO '131', '128', and '114' on a training day in the central zone of Kecskemét AB. MiG-29B fighter aircraft can be seen alongside.

During an exercise for OSCE observers, the RENEGADE aircraft was played by one of the *Albatrosseses*. ABV (Nuclear, Biological, Chemical) detection is shown in the picture, 27 September 2006

mander of the Kecskemét Air Base.
Brigadier General Nándor Kilián, Commander of Szentgyörgyi Dezső Airbase, expressed his hope that new training aircraft will soon be in service at Kecskemét.
Imre Szekeres, Minister of Defence, said: "I have prepared a call for an open international tender, which is a definitive solution. We are interested in buying, leasing, and renting aircraft. Such a process can take up to a year, the decision will be taken by the new government, but I don't want to have to start from scratch."
The planes had more or less flying hours at the time of the shutdown. Of the eight remaining aircraft, five L-39ZOs were planned to be sold. The 119 and 135 ornamentally painted examples, with a single field-painted 018, were housed in the Szolnok Repository (Hungary's military aviation museum). Side number 115 will enrich the collection of withdrawn aircraft in Kecskemét.
Part of the history of the *Albatros* is that some of the aircraft received from Germany (such as 124, 134, and 138) were overhauled at the Aero Vodochody factory, and after stripping off the Hungarian registration markings and paint, they were repainted with civil registration marks, flight restrictions, air supremacy grey, or other special patterns and colors requested by the customer, and sold to the United States, and Western Europe.
The 134 was operated in France, but crashed during an emergency landing on 30 April 2011 after an engine shutdown, injuring, but not killing, the pilot and passenger. The 114 was delivered to Groningen in the Netherlands with its original Hungarian livery and registration mark. Example 122 is located in Bensheim, Germany. Example 125 flew in the UK with the British registration G-JMGP.
135 and 136 are located in Tukums, Latvia. 137 flew with registration N639Z. 132 and 138 are in the Air Force in Mozambique. The former aircraft was given registration number 252, and the other without a registration number was probably used as a parts base. The Mozambique L-39ZO was overhauled in 2013 with Romanian assistance.

At the 2005 Kecskemét International Airshow, the L-39ZOs taxi out of the central zone for take-off for their flying display

Three L-39ZOs received as spare parts, without Hungarian side numbers, are currently located in Kecel, Kadarkút, and Szolnok, each in original German colors.

In 2008, at the Kecskemét Airshow, everything was set for Hungary to purchase a squadron of L-159 ALCA light combat aircraft. Before the contract was signed, however, the Swedish company SAAB also made an offer for the delivery of additional JAS-39C *Gripen* aircraft, and Hungary then withdrew from the contract with the Czechs.

After the change of government in 2010, the Fidesz-led government canceled the procurement of the L-39 successor. The training of pilots continued to be carried out in Canada for many years. After the Canadian training, however, the government decided to opt for joint European training. In 2023, NATO Flight Training Europe (NFTE) was established to provide multi-site training for helicopter, fighter, and drone pilots. The first two training courses will take place in Pardubice in the Czech Republic and the second in Decimomannu on the island of Sardinia. Some pilots have also been able to train in the United States. Both training courses will take place after the basic training on the Zlin Z-242L and 143LSi aircraft, which have been acquired in the meantime.

In April 2022, the government decided to acquire the latest L-39NG training, reconnaissance, and light combat aircraft from Aero Vodochody, which in the meantime will be majority-owned by Hungary. Of the 12 aircraft, eight training versions and four reconnaissance light strike fighter versions will enter service from initial delivery in 2023. The delivery of the aircraft did not take place due to fiscal reasons, the first two aircraft for the Hungarian part were delivered by the manufacturer for training of pilots of the Czech Air Force. On 19 January 2024, Major Sándor Csák took his first flight in the L-39NG aircraft. Together with him, several other pilots started their training in the Czech Republic.

Main **Two L-39ZO in close formation over Kecskemét AB on 2 August 2007**
Insets ***Albatros* '128' and '136' on final approach for landing**

Main L-39ZOs in front of the maintance hangar on 0 July 2005 at Kecskemét AB

Insets The L-39ZO '133' on static display in one of the hangars built for the JAS-39 Gripen at Kecskemét AB


135


135

The L-39ZO '135' was given a special paint scheme for the 70th anniversary of the Hungarian Air Force in 2008, and was named Shark Paul (Cápali)

The 'wasp' special painted scheme of L-39ZO '119' was painted in air superiority grey due to an incorrect command decision, but for the 70th anniversary of the Hungarian Air Force in 2008, it was given a special livery named Peter Shark (Cápeti)

The L-159B ALCA (Advanced Light Combat Aircraft) 6066 two-seat prototype of the Aero Vodochody L-39

After the retirement of the L-39ZO *Albatros*, there were plans in Hungary to acquire Aero Vodochody L-159B ALCA training and light strike aircraft. After 2022, the Hungarian state bought a large part of the shares of the Czech aircraft manufacturer Aero Vodochody. An agreement was signed for the purchase of 12 L-39NG aircraft. The first six aircraft are scheduled to arrive at Kecskemét AB in 2025

TOP ACES – ADVERSARY AIR SERVICES

TEXT BY MICHAEL LINTOTT-DANKS | **PHOTOS BY** MICHAEL LINTOTT-DANKS UNLESS STATED

Douglas A-4N *Skyhawk* '531' and '534' parked on the ramp at Nordholz Naval Airbase

Top Aces Enhancing Combat Readiness with Advanced Airborne Training

Top Aces provides advanced airborne training to the world's leading air forces, enhancing the operational readiness of combat forces by offering a realistic experience while prolonging fleet life.

Following a visit to Top Aces' main operating base in Nordholz, Germany, we spoke with Stefan Mueller, Senior Program Manager, to discuss Top Aces' role in the European theatre.

Q: What is your role within Top Aces?
A: As Senior Program Manager, I oversee the Top Aces German Program, handling operations and contract management for our German customers. Additionally, I fly training missions for Top Aces with the Alpha Jet.

Q: How long have you been in this role?
A: I joined Top Aces as Senior Program Manager in May 2022, which was the beginning of our new contract with the German Bundeswehr.

Q: What is your background?
A: I served in the German Armed Forces for 17 years until 2010, starting with the German Navy flying the Panavia Tornado and later with the German Air Force, which included tours in Afghanistan. After leaving the Bundeswehr, I worked for another contracted air training company in Germany. In 2022, I joined Top Aces, where I continue to manage business operations while flying missions.

Q: How many staff are there based in Europe?
A: Top Aces employs over 600 staff members worldwide.

Q: Was the participation in the ILA Berlin useful?
A: ILA Berlin is an excellent airshow, offering substantial networking opportunities with various industry stakeholders, including the Luftwaffe, German Armed Forces, procurement teams, suppliers, and Generals. Our presence there also enables us to engage with potential future recruits.
At the Royal International Air Tattoo, we showcased Top Aces' A-4 Skyhawk on static display, equipped with a new infrared search and track (IRST) system. This provided us with the opportunity to engage with various stakeholders and network effectively. The inclusion of the IRST allowed us to have in-depth discussions with potential customers about its functionality and the crucial role it plays in providing an accurate representation of threats during adversary air missions.

Q: What aircraft are flown in Europe and where are they based?
A: Our current European fleet includes the A-4 Skyhawk and the Alpha Jet, with operations in Nordholz and Laage Air Bases in Germany.
We previously operated from Wittmund AB until 2021 but moved to Nordholz due to airfield reconstruction. Since October 2023, we have established a new forward operating base at Laage AB in Northern Germany. This base is the largest Luftwaffe Eurofighter Typhoon base in the country and enables us to enhance our customer service in the region using our fleet of Alpha Jets. With the Weapons School, OTU (Operational Training Unit), and the fighter wing at Laage, we are able to work more closely with our

Top Aces operates eight A-4 *Skyhaws* at Nordohlz Naval Airbase

customers to better serve their needs.

Q: What is the split with the flying hours between the two bases?
A: We are still in the ramp-up phase at Laage, and we tend to fly more of the A-4s than the Alpha Jets currently. Nordholz remains our main operational base due to the frequent use of A-4s, which offer modern technology and provide significant value for our clients.

Q: With regards to the maintenance of these older airframes, how is this achieved? Are there any issues with spare parts and deep maintenance of the aircraft?
A: Our experienced staff and long-term supplier relationships ensure good availability rates for airframes. We have maintainers with extensive experience on the A-4 and a robust vendor and supplier support network in North America and Europe.
The Alpha Jet, a younger airframe, benefits from an even stronger supply chain with plenty of spare parts. We maintain a stock of Alpha Jets to serve as spare parts, minimizing flight delays due to parts shortages.

Q: What services does Top Aces provide to the Bundeswehr?
A: We offer a wide range of services to the Bundeswehr, catering to different branches of the military. For the Luftwaffe, we specialize in advanced adversary air (ADAIR) training, utilizing the latest AESA radar technology for better threat replication. We also conduct air defense training for the Navy, which involves simulating attacks on ships and coastlines to enhance their readiness.
Additionally, we provide close air support training for both the Air Force and Army ground troops. Our services include providing air assets for Ground Control Intercept (GCI) and offering officers specialized currency training. The GCI Officers learn how to guide jets to intercept aerial targets efficiently, optimizing the use of flying hours for 4th and 5th generation fighters to complete the easy 1v1 intercept basic setup. Our ability to provide longer station time at a reduced cost is more advantageous than utilizing Luftwaffe assets.
We also continue to provide target towing for the Luftwaffe, making up approximately 5% of the

These three A-4N *Skyhawks* are sitting on the ramp ready for the next flight at

This A-4N *Skyhawk* '367' served with the Israel Defense Forces with the serial '350'

services we provide.
For Close Air Support (CAS) services, we use the Alpha Jets, and we are the sole provider in Germany delivering practice bomb drops for the currency training of the joint terminal attack Controllers (JTACs).

Q: Was ADAIR the initial service provided by Top Aces to the Bundeswehr, with the other services added on as contracts developed and were awarded?
A: When discussing Top Aces' services to the Bundeswehr, it's crucial to understand the historical context. In the 1960s and 70s, the first contract air service agreement in Germany focused on target towing to support fighter aircraft with target gunnery training. As time progressed, these contracts evolved. When Top Aces assumed responsibility for the service in 2015, the Bundeswehr acknowledged the added value Top Aces brought and subsequently expanded the services to include Adversary Air.

Q: What upgrades have the Skyhawks and Alpha Jets had to provide these services?
A: The A-4 Skyhawk cockpit has undergone multiple upgrades to participate in the ATC environment. The Top Aces' proprietary "Advanced Aggressor Mission System" (AAMS) to the Skyhawk has been implemented in all our jets in addition to the modern AESA radar. This provides a sophisticated threat and challenge to the blue forces, allowing them to use their full sensor suite to identify and work with the emissions that we provide.
The Alpha Jet has also undergone system upgrades – the capability of dropping practice bombs being the most significant.

Q: What are the plans for future aircraft?
A: Top Aces possesses a high-performing, multi-tier fleet of aircraft to meet our customer's CAS and ADAIR training needs. We are continuously exploring opportunities to expand our offerings to stay ahead of evolving customer requirements.

Q: What potential growth is there for Top Aces in Europe?
A: We are foreseeing growth as military forces continue to modernize and adopt 5th-generation aircraft such as the F-35. Our cost-effective training solutions are providing increasing value as these advanced jets become more widespread. The growing procurement of expensive 5th-generation jets has underscored the importance of having our affordable training tools accessible to military forces.

Q: Further afield, how are the F-16s performing in the U.S.?
A: Top Aces has been diligently training the United States Air Force's (USAF) F-35 and F-22 pilots daily at Eglin and Luke Air Force Bases since 2022, boasting an exceptional mission effectiveness rate.
Our F-16 Advanced Aggressor Fighters (AAFs) deliver realistic, cost-effective training that not only enhances the skills of the USAF's 5th generation fleet but also extends their operational lifespan. The feedback we've received from the customer since the beginning of our training sessions has been extremely positive.

Q: Is there any potential for further growth for Top

An A-4N *Skyhawk* on the taxiway at Nordholz Naval Airbase after returning from a training flight. The aircraft flew with the Israel Defense Forces with serial number '329' and is now registered to C-FGYL. The Top Aces' serial is '498'

Aces in North America? Would slower-speed aircraft be purchased to provide CAS?

A: In Canada, Top Aces has been training the Royal Canadian Air Force since 2005 and will continue under the Contracted Airborne Training Services (CATS) contract, which runs through October 2029. In 2024, we introduced the A-4 AAF to our Canadian training fleet, enhancing the CATS offering with advanced radar and tactical datalink capabilities. This upgrade better simulates current adversary fighter aircraft, thereby improving the readiness training of RCAF fighter pilots, especially as they prepare for the transition to the F-35.

Top Aces envisages training RCAF fighter pilots throughout their careers, from initial selection into the advanced jet stream through Future Fighter Lead-in Training (FFLIT) and beyond. Additionally, we look forward to bringing Top Aces' military flight instruction expertise to Canada's Future Aircrew Training Program (FAcT) with SkyAlyne.

In the U.S., we have been providing support to the US Marine Corps (USMC) F-35s for almost a year. With the USMC's growing ADAIR requirements, Top Aces is ready to deliver additional capabilities through open architecture AAMS, including Link-16, IRST, and HOBS IR missile replication. We are uniquely positioned to assist the test community with our advanced open mission system capability for rapid and flexible test opportunities. Top Aces currently supports DARPA in test activities and has a history of supporting AFRL. Moreover, we are well-equipped to address the growing F-16 training requirements due to our experienced F-16 maintainers and pilots.

The recent acquisition of Blue Air Training, a leading provider of close air support (CAS) training based in the U.S., further enhances Top Aces' training capabilities. Blue Air Training operates various turbo-prop platforms, clearly focusing on expanding CAS offerings into new markets. Overall, Top Aces is committed to meeting the evolving needs of the U.S. military and test community, offering enhanced support for ADAIR and training while continuing to advance its capabilities through strategic partnerships and acquisitions.

About AAMS

The "Advanced Aggressor Mission System" (AAMS) was launched in 2021 after four years of research and development by Top Aces engineers and technicians in Montreal, Quebec, and Mesa, Arizona. This revolutionary new technology allows an aircraft to simulate the highly advanced capabilities of modern-day opponents in air-to-air combat while prolonging the customers' fleet life and generating cost savings.

The plug-and-play nature of AAMS allows for the addition of new and emerging sensors well into the future, which provides the flexibility to upgrade its aircraft and meet the needs of the Air Force for years to come. Powered by an open system architecture, AAMS enables the rapid integration of advanced sensors and functions, including:

- Active Electronically Scanned Array (AESA) air-to-air radar;
- Helmet-Mounted Cueing System (HMCS);
- Tactical datalink communications between aircraft and other entities;
- Infrared Search and Track (IRST) systems;
- High Fidelity Weapon Simulation allowing accurate replication of adversary tactics;
- Advanced Electronic Attack pod employment and passive RF detection capabilities; and
- An array of tactical functions coordinating the above systems to provide a spectrum of realistic adversary effects.

Top Aces first launched AAMS on its A-4N Skyhawk, which is currently in service with the Canadian and German Armed Forces, as well as other European customers. This same federated mission system is operating on Top Aces' F-16 aircraft in support of USAF F-35 and F-22 fighter pilots, generating second-to-none field performance and the most threat-representative adversary in the industry.

All photos this page by Ralf Jahnke

The A-4N *Skyhawk '532'*, registered to C-FGZO is ex-Israel Defense Forces '419'

Ralf Jahnke

A-4N *Skyhawk* '367' on final approach to land at Nordholz Naval Airbase (main image) and taxiing (right inset) to its parking position on Top Ace's ramp (left inset)

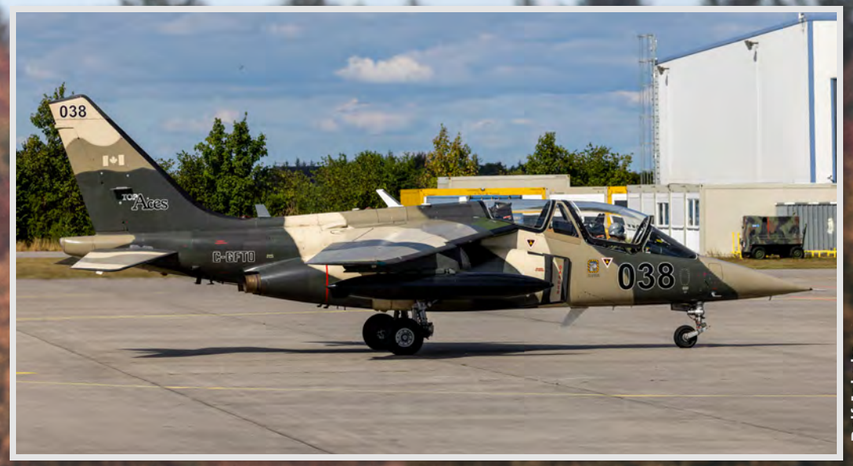
A-4N *Skyhawk* '495' and ex-Israel Defense Forces '405'. The pod mounted on the center line of the *Skyhawk* fuselage houses a winch with a tow line and a target attached to it to train air-to-air gunnery for the fighter jets. In operation the tow line with the target is reeled off the winch by 1,500ft (357m) behind the aircraft.

All photos this page by Ralf Jahnke

Currently Top Aces in Germany operates six ex-German Air Force Alpha Jet As

Peter Thivessen

Ralf Jahnke



Ralf Jahnke

Peter Thivessen

This Top Aces Alpha Jet A '038' served in the German Air Force with serial 40+38

Peter Thivessen

This Top Aces Alpha Jet A '040' is ex-German Air Force 40+40

All photos this page by Peter Thivessen

This Top Aces Alpha Jet A '069' is ex-German Air Force 40+69

MIGHTY IKE'S BATTLE AXE

REPORT BY PATRICK ROEGIES AND BEN GORSKI | **PHOTOS BY** AUTHORS UNLESS STATED

A C-2A Greyhound assigned to the *Rawhides* of Fleet Logistics Support Squadron (VRC) 40 launches from the flight deck of the aircraft carrier USS Dwight D. Eisenhower (Ike) U.S. Navy/Petty Officer 3rd Class Casey J. Hopkins

Introduction

CVN-69 USS Dwight D. Eisenhower deployed on 13 October 2023 to what was planned to be a European deployment in the 6th Fleet area of responsibility (AOR) cooperating and training with NATO allies. CVN-69 USS Dwight D. Eisenhower, the flagship of Carrier Strike Group TWO (CSG-2), has Carrier Air Wing 3 (CVW-3) embarked comprising eight operational squadrons. The presence of CSG-2 has played a crucial role in countering threats posed by opposing hostile forces in the region.

With the unexpected events taking place on 7 October 2023, the planned deployment area of operation was altered and reassigned to the 5th Fleet AOR with CSG-2 positioned in the Gulf of Aden and the Red Sea. With this change of plans, the Carrier Strike Group found themselves in a hostile and challenging environment during most of their deployment starting on their arrival on 4 November 2023.

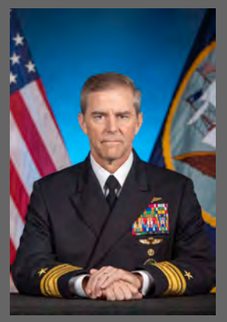
Patrick Roegies and Ben Gorski embarked on CVN-69 USS Dwight D. Eisenhower and assessed the situation on the strategic importance of the Carrier Strike Group deployment. The focus was on the capabilities of CVW-3 'Battle Axe', and their operational engagements with all hostile opposing forces, logistics support, and the broader implications for regional stability.

Change of plans

On 7 October 2024, the Palestinian-based Hamas initiated a raid on Israel. During this raid, a number of Israeli citizens were taken hostage by Hamas. Israel retaliated, launching a counterattack with an invasion of Gaza with the purpose of liberating the hostages taken. What followed were several developments that further escalated the conflict. Out of solidarity with the Palestinian state, Iran responded by launching a number of ballistic missiles at targets located within Israeli sovereign territory. The Houthis also responded by attacking military and commercial merchant ships in the Red Sea with ballistic missiles, unmanned aerial vehicles (UAV), and unmanned surface vessels (USV). The then-President of the United States Joe Biden communicated that the United States would do everything it could to de-escalate the conflict and secure maritime trade routes. The immediate outcome was that CSG-2 with CVN-69 USS Dwight D. Eisenhower as their flagship received orders to position themselves in the Red Sea and the Gulf of Ayden, with the aim of eliminating all possible threats.

Rear Admiral Marc Miguez, the acting commander of CSG-2, commented "There are a lot of parties involved in this conflict. In order to keep track we have 360-degree coverage around the Eisenhower and any considered high-value asset. That is something the Navy trains for. We create bubbles around all our

An F/A-18E *Super Hornet* assigned to Strike Fighter Squadron 105 (VFA-105) *Gunslingers* just launched from one of IKE's stern catapults



Rear Admiral Marc Miguez

ships and use our aircraft for command, control and surveillance away from the high-value vessel."

Strategic Deployment and Mission Overview

The of the Eisenhower CSG supports the vision and mission of the United States mission, to support freedom of navigation and protect innocent lives. Rear Admiral Miguez continues: "Given the different type of warfare, the demands and responsibilities of the mission required a regrouping and reorientation of Eisenhower's crew and resources." Rear Admiral Miguez also emphasized the importance of projecting power and defending high-value assets and the freedom of navigation on the trade routes. "What we do is project airpower and have our guided missile destroyers (DDG) assigned to the CSG, operate further away from us to neutralize potential threats before they reach us."

The Eisenhower's presence in the region had already led to the successful escorting of over fifty high-value maritime vessels. Rear Admiral Miguez continues: "It is our primary mission to protect innocent maritime traffic that flows through here via international law. Because of all this global trade and commerce have been impacted. Although most of the routes have changed, some companies continue to navigate through here, and we remain on mission to provide them with protection." Throughout conducting their operational tasks, the Eisenhower CSG was supported by a coalition of international naval ships, including those from the Netherlands, Italy, France, the United Kingdom, Germany, and Greece.

Collaboration with international allies is integral to their operations. "We've been able to use coalition partners. There's been Dutch ships, Italian, French, UK, German, Greek warships here as well," Rear Admiral Miguez shared. This international cooperation allows for a more extensive and effective coverage area. "I have my forces arrayed as far out as I can command and control, but I've also got the ability to communicate with the partners and allies. We feed them intelligence, give them a heads up about threats."

The complexity and speed at which the situation developed required a high degree of flexibility and readiness from Eisenhower's crew. "I am most proud of these sailors," declared Hill. "The amount of stress and constant vigilance they demonstrate every day is impressive. We never stop; we have 24/7 watch and rotate them regularly to keep them sharp."

Eisenhower's mission in the 5th Fleet highlights the crucial role of the United States Navy in maintaining the safety of international shipping routes and responding to unexpected global crises. As the crew prepares for future challenges, their dedication and professionalism remain a beacon of stability in a turbulent world. The carrier entered the Red Sea on November 4, marking its first operational presence in the region since the CVN-76 USS Ronald Reagan's deployment in 2021.

This deployment is a response to escalating tensions and threats posed by Houthi militias, particularly their drone and missile attacks targeting maritime traffic and commercial shipping lanes. Before its redeployment to the Red Sea, the Eisenhower participated in joint exercises with the USS Gerald R. Ford (CVN-78) in the Mediterranean. These exercises underscored the commitment of the United States Navy to maintain operational readiness and enhance interoperability in the face of evolving regional threats, including responses to the Russo-Ukrainian War and NATO's strategic imperatives in the Eastern Mediterranean.

Change of plans

Departing from Naval Station Norfolk, Virginia CVN-69 USS Dwight D. Eisenhower joined CSG-2. Transiting through the Strait of Gibraltar on 28 October 2023, CVN-69 was originally scheduled for deployment within the 6th Fleet AOR. The mission included participating in various NATO exercises, focusing on strengthening cooperation and interoperability among allies in the Mediterranean. However, everything changed after the events taking place on 7 October 2023. The unexpected escalation of the conflict had immediate consequences for the planned deployment of the Eisenhower. What was initially a routine exercise in the Mediterranean became an urgent mission to the 5th Fleet in the Middle East. The Eisenhower became tasked with the crucial job of protecting merchant ships from attacks by hostile

F/A-18E *Super Hornet* of VFA-105 in 'buddy-buddy-tanker' configuration (left) and in 'ground attack' configuartion (right)

VFA-105's and VFA-32's "CAG bird" parked next to each other on IKE's flight deck. VFA-105's F/A-18E (foreground) is in the socalled "Five wet" configuration, with four 480 gallon external fuel tanks under the wings and a centerline hose-and-drogue "buddy" refueling pod.

1

2

forces, who were threatening the shipping routes. Supported by Iran, the Houthis had intensified their attacks on commercial vessels in the region, seriously endangering the safety of international trade.

The mission of CVN-69 USS Dwight D. Eisenhower in the 5th Fleet AOR highlights the crucial role of the United States Navy in maintaining the safety of international shipping routes and responding to unexpected global crises. As the crew prepares for future challenges, their dedication and professionalism remain a beacon of stability in a turbulent world.

Captain Chris "Chowdah" Hill, the commanding Officer of CVN-69 USS Dwight D. Eisenhower, comments: "There is a lot of work to do. I mean, when I started the deployment, I expected that in the worst case just given the tempo that we are seeing so far, we would get extended. Nobody, however, could predict events taking place on 7 October 2023 and it was certainly not on my radar. It completely changed what we were supposed to do. A seven-month deployment with multiple port calls in Europe, participating in NATO exercises, and strengthening our relationships with our NATO allies. That was my dream, but as it turns out we ended up doing this. But what we have done here from a United States Navy perspective is a once-in-a-generation opportunity and one we have been training for our entire career and has been very rewarding in terms of the combat we have been doing."

Redefining

In order to cope with operating in a very dynamic environment and reduce the time to detect and eliminate the hostile object, CVW-3 has three different tactical scenarios they can apply in a specific counter-measured approach. Also, elements of any of the three scenarios can be integrated to optimize the specific mission with the purpose of risk reduction to the mission, the aircraft, and their crews.

The first scenario involves the standard combat air patrol sorties, which usually consist of a Northrop Grumman E-2C Hawkeye for air surveillance and early warning purposes, a Sikorsky MH-60S for search & rescue purposes and a specific composition of Boeing F/A-18E/F Super Hornet fighter aircraft, EA-18G Growler electronic warfare aircraft and a F/A-18F for possible air refueling purposes. When a hostile object is detected, the Hawkeye directs the designated aircraft to their targets with the purpose of eliminating the threat. This is the preferred scenario for protecting objects which are considered to be high-value assets.

In case there is no active patrol out there and a threat is detected, the Carrier Air Wing projects a second scenario in which the required assets are scrambled off the flight deck, in order to deal with the detected threat. From start-up to launch, this scenario can take up to 30 minutes to have the required aircraft airborne heading for their designated targets and is

3

The F/A-18E *Super Hornet* (VFA-105) can fold its wings to reduce the space needed when the aircraft is parked. This is typical for carrier-based aircraft

usually projected in case there are no high-value objects nearly to protect.

In case the time is extremely limited and the threat level is high, the Carrier Air Wing can decide to have fully fueled and armed aircraft at the go at an alert five catapult. This means when the alert is raised the aircraft can be airborne in 2-3 minutes time.

Depending on the threat level and the expected time to intercept, the Carrier Air Wing can use any of the three scenarios to cope with the threats in a very dynamic environment.

Since the Eisenhower and its Strike Group arrived in the Red Sea, they have encountered multiple and almost continuous engagements with hostile forces. These confrontations predominantly involve intercepting and neutralizing ballistic missiles, UAVs, and USVs, which pose significant threats to regional stability and international maritime commerce. The Boeing F/A-

VFA-105 F/A-18E *Super Hornet* loaded with live ammunitions taxis to the catapult

Landing of an F/A-18E assigned to VFA-105:

left approaching the carrier deck with tail hook down

right decelarating with the help of an arresting wire catched by the aircraft's retractable tail hook

above clearing the landing zone

Strike Fighter Squadron (VFA) 131 *Wildcats* – F/A-18E *Super Hornet*

18E/F Super Hornets and Boeing EA-18G "Growlers" assigned to CVW-3 have been at the forefront of these operations, showcasing their capability to respond swiftly and decisively to emerging threats. On 26 December 2023, a notable engagement occurred when aircraft assigned to CVW-3, alongside the USS Laboon (DDG-58), successfully intercepted hostile missiles and drones aimed at coalition naval forces operating in the region. The destroyers assigned to CSG-2, including USS Mason (DDG-87) and USS Gravely (DDG-107), have also encountered multiple incidents, including an attempted missile strike against the USS Gravely by hostile forces, underscoring the ongoing operational challenges and the critical role of United States naval assets in safeguarding regional security. Despite claims and misinformation propagated by the opposing media, claiming damage to the CVN-69 USS Eisenhower, Captain Hill has consistently affirmed the operational integrity and readiness of the ship. Disinformation campaigns aimed at undermining coalition efforts highlight the broader information warfare tactics employed by non-state actors in the region.

"To manage these myriad threats, the United States Navy relies on a combination of airborne surveillance and strategic positioning of destroyers. "We project power airborne-wise and then we take our guided missile destroyers (DDG), and we also have them operate forward and away from us. If something is being flown at us that might pose a threat, we check it out. If it is a threat, we try to take out that threat away from us," Rear Admiral Miguez commented.

The current conflict in the Gulf region however requires a different strategy and new tactics needed to be defined in order to deal with the situation at hand, Capt. Hill explains: "Ballistic missiles have never been shot in combat, and we are shooting them down as one of our primary targets. Other main targets are UAVs and USVs and unmanned armed drones carrying warheads, which we have to eliminate." Our weapons systems integrated into our aircraft however were all specifically designed for air-to-air and air-to-ground capabilities in other words fighting other aircraft or designated ground or naval targets.


Captain Chris "Chowdah" Hil

Captain Hill continues "Our aircraft shooting the ballistic missiles, UAVs, and USVs down with AIM-9X Sidewinders designed to shoot down other aircraft. The team has done an excellent job dealing with the challenges at hand and figured out a way to make it work. Initially, we were firing off a lot of missiles while transitioning from the traditional air to air,

Left VFA-131's 'CAG bird' is taxiing to one of the two bow catapults

Right The catapult's towbar is attached to F/A-18E's nose gear

Main The steam-catapult and the aircaft's jet engines accellerate the *Super Hornet* to about 150 kts in just two seconds

but as we went along, we found a sophisticated, effective, and efficient way to deal with any of the threats. It has been some sort of an evolution in how we are attacking the problem of each specific issue."

Detecting the smaller UAVs and USVs has been a challenge as well. The earlier the possible threat is detected the more time the aircraft assigned to CVW-3 has to plan and execute their counter-measured approach. The smaller types of UAVs and USVs also required a different way of targeting. Capt. Hill comments: "Yes, they're using different oriented kind of mechanism and all I can say is that we got smart as we gained experience and figured out the best way to use and adapt our existing systems to deal with the specific challenge at hand."

Stepping up to the plate

significant aspect of the carrier operations in the Gulf of Aden and Red Sea is countering hostile drone and missile threats. The USS Dwight D. Eisenhower has adopted a proactive approach, utilizing its formidable capabilities to intercept and neutralize these threats before they can inflict harm on coalition forces or disrupt maritime traffic. According to recent reports, the DDGs accompanying the Eisenhower have fired over one hundred examples of the Standard series of surface-to-air missiles, specifically targeting ballistic missile attacks. The F/A-18E/F Super Hornets of CVW-3 have also been actively engaged in this effort, employing air-to-air missiles like the AIM-9X Sidewinder and AIM-120 AMRAAM, on ballistic missiles, UAV and USV which has proven highly effective against the smaller more challenging to detect targets threatening the friendly assets, due to its advanced targeting and guidance systems. Additionally, the AIM-9X Sidewinder missile serves as a reliable secondary option for engaging these small, agile targets, though using onboard guns remains a challenging and potentially risky proposition given the nature of the threat posed by the smaller object.

Maintenance personnel prepare the F/A-18E *Super Hornet* '301' assigned to VFA-131 for flight

Strike Fighter Squadron (VFA) 32 *Fighting Swordsmen* – F/A-18F *Super Hornet*

Rear Admiral Mark Miguez commented: "The adaptability of the crew has been tested by new and sophisticated threats, including unmanned assets. We have very limited response time, especially for merchant ships. What we have been able to do, not only through just US, but with coalition partners, is provide timely assistance." Indian naval forces recently assisted a vessel in the Gulf of Aden that had been hit, preventing further disaster.

The "Battle Axe" – a blue-collared tip of the spear

CVW-3 'Battle Axe' is renowned for its effectiveness despite operating traditional aircraft platforms, distinguishing itself as a 'blue collar' air wing within the US Navy.

Captain Marvin "Starvin" Scott

Captain Marvin "Starvin" Scott, Commander of CVW-3, commented: "This tour has been extremely rewarding just coming out here with an entire Air Wing and watching them come together. We have been fortunate to do what we have been training for most of our careers. We culminate all of the training into mission effectiveness on a pretty complicated mission with one singular purpose, to save lives.

The operational effectiveness of CVW-3 is guaranteed by its fleet of F/A-18E/F Super Hornets EA-18G Growlers, the E-2C-2000 Hawkeye, and the MH-60S/R Seahawk capable of performing a wide range of missions from air superiority and close air support to airborne early warning and electronic attack. As most of the East Coast-based, Carrier Air Wings CVW-3 is not equipped with the state-of-the-art Lockheed Martin F-35C Lightning II yet and is one of the last Air Wings that has not transitioned to the Northrop Grumman E-2D Hawkeye yet. Despite not deploying these advanced platforms, the 'Battle Axe' remains as effective as necessary, as affirmed by senior naval commanders within CSG-2.

As part of CSG-2, CVW-3 holds significant responsibilities. Capt. Scott explains: "I'm responsible for essentially all the operations and the combat execution of the eight squadrons assigned to CVW-3. This includes ensuring the integration and combat readiness of various aircraft squadrons, each playing a crucial role in the overall mission and effectiveness of the carrier strike group." The integration of squadrons and the effective employment of their aircraft are central to Captain Scott's duties. "My responsibility essentially is to make sure all the squadrons are integrated and effectively able to employ their aircraft to the maximum extent of combat capability. This involves coordinating with component commanders and ensuring seamless interleaving into the broader joint efforts. Maintaining a high level of operational readiness is a constant focus."

Capt. Scott elaborates on the extensive training

Two-seater F/A-18F 'CAG bird' assigned to Strike Fighter Squadron (VFA) 32 *Fighting Swordsmen*

involved: "Prior to deployment, we perform a structured preparation phase. We do extensive training out on the ship off the coast of the Atlantic, and we do extensive training at Naval Air Station Fallon, Nevada. This rigorous regimen ensures that the air wing remains prepared for any mission, continuously honing its skills and systems. The current deployment presents unique challenges, particularly in a relatively nascent theater like the Red Sea. The major challenge has been that this is a nascent theater for us operating in the Red Sea with the carrier strike group for this long.

Meeting this new way of warfighting, however, required adapting to the situation at hand Capt. Scott continues. "The evolving threat landscape, especially with the rise of UAVs, USVs, and other small projectiles, requires constant adaptation and learning. Adapting to new tactics and technologies is a continuous process in which we improve on a daily basis. There is a lot of learning at the pace of combat. You know, when they introduce new tactics and technology on the Houthi end, we must adapt and overcome. This also involves not only adjusting tactics but also upgrading systems to counter emerging threats effectively."

"In a vast operational area with diverse threats, prioritization is key." Captain Scott emphasizes the importance of clear communication and focus: "We try and focus on communicating effectively. By means of clear, concise communication, making sure that everybody understands exactly what the priorities are. This clarity enables the squadrons and maintainers to operate efficiently, even under high-tempo conditions."

In a conflict situation with a very high operational tempo, logistical support plays a crucial role in sustaining operations. Captain Scott highlights the robust logistics chain that ensures the readiness of both aircraft and personnel. "We have a very robust logistics chain that allows us to maintain the assets," underscoring the continuous efforts to keep the air wing in top condition.

Given the unavailability of the new state-of-the-art F-35C Lightning II and the E-2D Advanced Hawkeye within the air wing, Captain Scott shares his insights. "While these advanced aircraft bring significant capabilities, I praise the air wing on their ability to excel with the conventional models. We consider ourselves a blue-collar air wing, projecting excellence with the capabilities that have been provided to us, and we are pretty proud of it!" Looking ahead, Capt. Scott discusses the future priorities for the air wing, including potential upgrades to aircraft and systems: "When we get back home, our aircraft are being subjected to serious maintenance, in some cases up to depot level.

Left F/A-18F in "Five wet" configuration

Right Some fighter pilots stencil "victory marks" on the fuselage of their jets to showcase how many bombs and missiles were launched and Houthi assets destroyed by that jet

Strike Fighter Squadron (VFA) 83 *Rampagers* – F/A-18E *Super Hornet*

We are scheduled to transition Airborne Command and Control Squadron VAW-123 here relatively soon to the E-2D. The strategic priorities however remain focused on maintaining readiness and the ability to execute all assigned missions effectively.

When asked about the origin of the nickname of CVW-3 "Battle Axe," Captain Scott stated he did not know the exact history of how the Air Wing earned the nickname but appreciates its symbolism. Capt. Scott comments: "We are the long-range right arm of the carrier strike group, so it makes sense," he reflects, embodying the spirit and resilience of the air wing.

Rear Admiral Miguez also touched base on the technological advancements in naval operations, comparing the conventional systems and assets with the latest technology. "We don't have the disposal of the state-of-the-art E-2D or F-35C, but please bear in mind, this ship is forty-seven years old, and it is still doing the same mission that it was intended to do forty-seven years ago. And as it keeps proving, it is doing the job quite effectively," he stated with pride.

Operational effectiveness is underpinned by its fleet of F/A-18E/F Super Hornets EA-18G Growlers and the E-2C Hawkeye, capable of performing a wide range of missions from air superiority and close air support to airborne early warning and electronic attack. Despite not deploying advanced platforms like the F-35 or E-2D, the 'Battle Axe' remains as effective as necessary, as affirmed by Rear Admiral Miguez.

Operational Milestones and Achievements

The operational achievements of USS Dwight D. Eisenhower and CVW-3 in the Gulf of Aden and Red Sea underscore the indispensable role of the Carrier Strike Group in regional security and stability. As of recent reports, the aircraft assigned to CVW-3 have conducted numerous sorties, resulting in the deployment of more than three hundred bombs and missiles against identified targets. The silhouettes painted on the sides of the cockpits serve as visible testimony to the contributions of the Air Wing, symbolizing successful missions and engagements against their designated targets. These operations highlight not only the operational process of CVW-3 but also the collaborative efforts of the entire carrier strike group, including the DDGs and logistics support elements. The synergy between air, surface, and logistical assets enables sustained operations and ensures the Eisenhower's ability to project power and respond decisively to emerging threats in a volatile and dynamic operational environment. Despite the high-stress environment, the crew's morale and performance have remained exceptional.

This picture shows the F/A-18E 'CAG Bird' of VFA-83 *Rampagers*

F/A-18E assigned to VFA-83 *Rampagers* is parked on the flight deck

Changing command - continuing Naval operational excellence

Upholding Naval Excellence and Commitment, the USS Dwight D. Eisenhower's ongoing deployment in the Gulf of Aden and Red Sea exemplifies the United States Navy's unwavering commitment to maritime security, operational excellence, and international stability. CVN-69 USS Dwight D. Eisenhower, along with Carrier Air Wing 3 'Battle Axe,' stands ready to confront emerging threats, protect vital sea lanes, and support regional allies and partners in maintaining peace and stability. Through its extensive operational engagements against hostile threats, the Eisenhower has demonstrated the pivotal role of carrier strike groups in modern naval warfare. The synergy between air, surface, and logistical components within the carrier strike group ensures sustained readiness and effectiveness in addressing dynamic and multifaceted challenges. This integrated approach not only enhances the strike group's combat capabilities but also strengthens interoperability with coalition partners, fostering a collective security framework in the maritime domain. Looking ahead, the USS Dwight D. Eisenhower will continue to operate in the Gulf of Aden and the Red Sea, adapting to evolving security dynamics and maintaining a vigilant posture against potential threats. As geopolitical tensions persist and regional instability remains a concern, the carrier strike group's presence serves as a reassuring beacon of stability, reinforcing America's enduring commitment to global security and defense cooperation. In conclusion, the Eisenhower's mission in countering Houthi threats underscores the Navy's strategic resolve and operational effectiveness in safeguarding maritime interests and promoting stability in critical regions. The dedication and professionalism of CVW-3 'Battle Axe' exemplify the Navy's core values of honor, courage, and commitment, ensuring that the Eisenhower remains a formidable force for peace and security in the Gulf of Aden, Red Sea, and beyond.

Rear Admiral Miguez performed his last operational flight from IKE on 11 June 2024 in a F/A-18F Hornet assigned to VFA-32 Fighting Swordsmen, prior to the change of command ceremony taking place on 18 June 2024. The day marked a momentous occasion as CSG-2 bid farewell to Rear Admiral Marc Miguez and welcomed Rear Admiral Kavon Hakimzadeh as their new Commander. It was a time to honor the incredible leadership of Rear Adm. Miguez and extend a warm welcome to Rear Adm. Hakimzadeh as he takes the helm continuing excellence and success under his command!

Despite the high-stress environment, the crew's morale and performance remain exceptional. Rear Admiral Marc Miguez commented on his most rewarding achievement during his command: "What am I most proud of? I am most proud of these sailors. The amount of stress and the constant vigilance they maintain 24/7, is incredible. They

The pilot of this F/A-18E assigned to VFA-83 is just about to touch the deck with his aircraft and catch one of the four arrester wires

take the technology we've been training with and employ it effectively. The success we've achieved is a testament to their training and leadership." As this deployment continues, the resilience, skill, and cooperation of the U.S. Navy and their international partners remain critical in maintaining stability and security in this volatile region. The crew's unwavering commitment and adaptability underscore their role as a formidable force in modern naval warfare.

"We do not stop, we got watch and we adapt our way of operating to overcome the challenges thrown at us while working under high pressure. Every single day, we rotate our people as we do not put them on a console for a long period of time. But I am so proud of the performance of those sailors. And, well, by the way, to take the conventional technology that we have been talking about using, you know, we have been training with and now the team is actually employing it to a level of excellence that is extraordinary. And

VAW-123 E-2C-2000 'CAG Bird' landing on the angled flight deck. The angled flight deck allows the use of two catapults while aircraft land

so that is what I am proud of is that we have been able to take this opportunity and show what we are made of."

"We stay here until we will be relieved or when the conflict situation has been de-escalated. With three monthly extensions of the duration of the deployment, we asked a lot from our sailors but did not result in losing focus. Not for a minute. With only one port call the team has been under high strain, but never backed down on what we are supposed to do here. Motivating this team was easy by the high level of professionalism and generating the daily successes, the saving of lives. I think this deserves the highest compliment imaginable."

A VAW-123 E-2C-2000 is just launched by a steam catapult (main), is climbing out (left), and returns to the carrier (right)


600


Screwtops
600


Screwtops
603
"Patches"


42
DANGER
42

Fleet Logistic Support Squadron (VRC) 40. Det. IV *Rawhides* – C-2A *Greyhound*

Ensuring future regional stability

The presence of CVN-69 USS Dwight D. Eisenhower and CVW-3 in the Gulf of Aden and Red Sea reaffirmed the commitment of the United States to regional stability and security. Beyond countering immediate threats posed by hostile forces, the presence of the Carrier Strike Group serves as a deterrent to align activities and promotes freedom of navigation in international waters.

This proactive posture supports regional allies and partners, strengthens maritime security cooperation, and reinforces the rules-based international order in critical maritime chokepoints. Furthermore, the Eisenhower's deployment underscores the enduring strategic importance of carrier strike groups in projecting power, maintaining deterrence, and responding decisively to emergent crises. As the global security landscape continues to evolve, the flexibility, adaptability, and operational effectiveness demonstrated by CVW-3 'Battle Axe' highlight the indispensable role of naval aviation in shaping regional security dynamics and safeguarding vital maritime interests.

Looking ahead, CVN-69 USS Dwight D. Eisenhower ceased its operational tasks operating in the Gulf of Aden and Red Sea, adapting to evolving security dynamics and maintaining a vigilant posture against potential threats. On Friday 21 June 2024, CVN-69 left the Red Sea for the Mediterranean and will start its journey home after over eight months of deployment. CVN-71 USS Theodore Roosevelt, with CVW-11 embarked, currently positioned in the Pacific, will be dispatched to the Middle East to maintain presence. he Eisenhower CSG departed the United States Central Command area and will remain briefly in the European Command area before returning home after supporting regional deterrence and force protection efforts.

Although the Theodore Roosevelt CSG has departed the Indo-Pacific for the U.S. Central Command area, the United States will maintain a robust Indo-Pacific presence to strengthen peace, stability, and deterrence alongside allies and partners. The destroyer escorts assigned to the Eisenhower strike group will remain in the 5th Fleet AOR. Secretary of Defense Lloyd Austin decided not to extend the Eisenhower's deployment for a third time. The carrier has been deployed for over eight months, the longest of any U.S.-based carrier in the past five years.

The C-2A *Greyhound* is used as COD (Carrier Onboard Delivery) aircraft, transporting passengers, mail, and supplies to and fom the aircraft carrier.
The U.S. Navy is in the process of replacing the *Greyhound* with the CMV-22B *Osprey tilt-rotor aircraft*

Electronic Attack Squadron (VAQ) 130 *Zappers* – EA-18G *Growler*


503
VAQ-130
500
DOMINATE
503


503
DOMINATE


503
VAQ-130
503
ADAN CORTEZ
ORANGE CITY, TX

Helicopter Maritime Strike Squadron (HSM) 74 *Swamp Foxes* – MH-60R *Seahawk*

HSM-74's primary mission area is the protection of the strike group through anti-surface warfare (ASUW) and anti-submarine warfare (ASW)

Helicopter Sea Combat Squadron (HSC) 7 *Dusty Dogs* – MH-60S *Knighthawk*

The primary missions of HSC-7 are Search and Rescue, Combat Search and Rescue, Naval Special Warfare (NSW), Anti-Surface Warfare (ASUW), and logistics support


514
NAVY


14

CARRIER AIR WING 3 (CVW-3) "BATTLE AXE"

Squadron	Aircraft type	Modex	Base
Strike Fighter Squadron 32 VFA-32 "Fighting Swordsmen"	F/A-18F *Super Hornet*	AC-1xx	NAS Oceana
Strike Fighter Squadron 83 VFA-83 "Rampagers"	F/A-18E *Super Hornet*	AC-2xx	NAS Oceana
Strike Fighter Squadron 105 VFA-105 "Gunslingers"	F/A-18E *Super Hornet*	AC-4xx	NAS Oceana
Strike Fighter Squadron 131 VFA-131 "Wildcats"	F/A-18E *Super Hornet*	Ac-3xx	NAS Oceana
Electronic Attack Squadron 130 VAQ-130 "Zappers"	EA-18G *Growler*	AC-50x	NAS Whidbey Island
Airborne Command and Control Squadron 123 VAW-123 "Screwtops"	E-2C-2000 *Hawkeye*	AC-60x	NS Norfolk
Helicopter Sea Combat Squadron 7 HSC-7 "Dusty Dogs"	MH-60S *Knighthawk*	AC-61x	NAS Norfolk
Helicopter Maritime Strike Squadron HSM-74 "Swamp Foxes"	MH-60R *Seahawk*	AC-70x	NAS Jacksonville
Fleet Logistic Support Squadron 40. Det. IV VRC-40 "Rawhides"	C-2A *Greyhound*	(JK-)xx	NAS Norfolk

USS DWIGHT D. EISENHOWER (CVN-69)

Commissioned	18 October 1977
Displacement (full load)	92,955 tonnes
Length overall	332.9m
Width	40.8m
Height	11.3m
Speed	30+ knots
Endurance 16 days for aviation fuel (steady flyingG)	

Crew (ship)	~ 3,200
Crew (air wing)	~ 2,450
Crew (flag)	~ 70
Flightdeck	332.9m
Angled flightdeck	237.7m x 76.8m
Catapults	4
Arrestor wires	4

WEAPON INSTRUCTOR COURSE 2024

ARTICLE BY KRIS CHRISTIAENS

Royal Netherlands Air Force F-35A *Lightning II* assigned to 322 Squadron

Weapon Instructor Course 2024

November saw the completion of the second phase of the prestigious Weapon Instructor Course (WIC) at the Leeuwarden Air Base in the northern part of the Netherlands. The Weapon Instructor Course is a highly regarded training program that aims to strengthen top-level tactical leadership and promote the integration of different weapon systems and support services. This is of great importance, especially as NATO is increasingly considering the defense of its territory. Given the war on Europe's eastern border, just an hour and a half away, and rising international tensions, this kind of training is more relevant than ever. The participants, which include fighter pilots and specialists such as sensor operators, Patriot operators, intelligence officers, and Air Battle Managers, had previously completed an intensive theory and practice phase in Norway before starting another phase in their training program at the Leeuwarden Air Base.

The training is provided by the Weapons School of the 323 Air Combat Development Center at the Leeuwarden AB. This is a knowledge center in the field of tactical air operations. During the final phase of the WIC, trainees carried out numerous missions over the North Sea and military airspace over the northern part of the Netherlands. This also included evening missions. Training in darkness is necessary to best prepare both pilots and ground personnel for their task. When it really comes to fighter deployment, it often happens in the dark. Therefore, the early falling darkness in the month November was the perfect time to train this.

The final exercise was all about 'Large Force Employment'. This involved the planning and deployment of about 30 aircraft. Leeuwarden AB is an ideal location for this program because of its proximity to the training area over the North Sea and the NATO training site Vliehors Range. Tactical fighter flying and gunnery exercises have been carried out here since the 1950s, making this airbase a crucial training center within NATO. Altogether, the WIC 2024 training program was attended by 29 trainees from the Netherlands, Norway and Belgium who carried out missions using F-35 and F-16 fighter jets and the unmanned MQ-9 Reaper. Also participating in the final phase of WIC 2024 were Panavia Tornado and Eurofighter Typhoon fighter aircraft from Germany's Taktisches Luftwaffengeschwader 51 "Immelmann" and Taktisches Luftwaffengeschwader 71 "Richthofen". During the missions, two Learjet aircraft from AEC Skyline and Saab Nyge Aero also participated, equipped with onboard electronic warfare equipment such as jamming pods.

The author would like to thank Spotting Group Volkel and Aviation Group Leeuwarden for inviting and organizing a spotting event during the last week of WIC 24.

Royal Netherlands Air Force F-35A *Lightning II*s assigned to 313 Squadron

Royal Netherlands Air Force F-35A *Lightning II* assigned to 322 Squadron

Royal Norwegian Air Foce F-35A *Lightning II* assigned to 132 Luftving at Ørland AB

F-35A *Lightning II* on final approach to runway 05 at Leeuwarden AB

German Air Force Tornado assigned to TaktLwG 51 "I" with full afterburner seconds before releasing the brakes for the take-off run

German Air Force Tornado ECR assigned to TaktLwG 51 "I" returing to Leeuwarden AB after an afternoon mission

Night take-off of a German Air Force Tornado IDS assigned to TaktLwG 51 "I" top and a Belgian Air Force F-16AM *Fighting Falcon* assigned to 10 Wing bottom

Take-off on runway 05 of an F-16AM *Fighting Falcon* assigned to 10 Wing of the Belgian Air Force

Belgian Air Force F-16AM turning final approach while a German Tornado performs an overflight

The EF2000 Eurofighter assigned to Taktisches Luftwaffengeschwader 71 "Richthofen" taxis to the runway for a night mission

This Learjet 35 from the Swedish Saab Nyge Aero with jammer equipment supported the Weapn Instructor Course

FLYGVAPNET IN LAAGE

ARTICLE BY RALF JAHNKE

Flygvapnet visited the Laage AB twice this year with its *Gripen* fighter jets to train and coordinate operational procedures with the Luftwaffe, particularly over the Baltic Sea region

In the autumn of 2024, six Swedish JAS-39C/D *Gripen* fighter aircraft from the 171st Stridsflygdivision visited Laage AB in eastern Germany. The aircraft belong to Flygflottilj 17 from Ronneby-Kallinge AB in the Blekinge region. This was the second visit by a *Gripen* fighter squadron this year. Since Sweden joined NATO on 7 March 2024, Flygvapnet has been increasingly seeking contact with the German Air Force. Both countries are neighbours of the Baltic Sea and therefore have a great interest in getting to know and coordinating each other's operational procedures. The day-to-day work of the alliance is about pooling the respective forces of the two air forces and deploying them effectively in the joint operational area of the Baltic Sea. During the two weeks, the Swedish contingent and the deployed component of the TaktLwG 71 'Richthofen' jointly carried out mission planning and operational flights over northern Germany. This also included aerial refueling missions over the North Sea. The evaluation of the flights in particular provided a learning effect for future deployment procedures. Parts of the Swedish 21st Air Maintenance Company and ground support equipment were also relocated to Laage to provide technical support for *Gripen* flight operations.

A Swedish delegation with five *Gripen* aircraft from Såtenäs visited Laage just two months after joining NATO. The week-long deployment was an exchange at weapons school level. The *Gripen* test unit based in Linköping is also responsible for tactical and operational development and is the counterpart to the German Air Force Weapons School in Laage. The eleven Swedish pilots came from all three *Gripen* task forces, while the *Gripen* and technicians of the 40-strong contingent were provided by the F7 squadron in Såtenäs. From the outset, the aim was to drive integration forward quickly, according to the motto: train together, learn from each other, and harmonize differences.

The *Gripen* is a single-engine, multi-role combat aircraft that has been in series production at Saab since 1995. JAS stands for fighter, attack, and reconnaissance. It is the successor to the Saab 37 *Viggen* from the 1970s. The Swedish Air Force is being adapted to new future tasks. Today, around 80 *Gripen* C/D fighter aircraft are still in service. Several new orders have been placed with Saab, and 60 new JAS-39 *Gripen* E versions will join Flygvapnet

The 171st Stridsflygdivisionen of the Flygflottilj 17 arrives at Rønneby AB in Laage. The deployment consisted of five JAS-39C and one JAS-39D

in the coming years. Up to 24 new *Gripen* E aircraft are to be built each year. In 2030, Flygvapnet would then like to deploy a total of 60 JAS-39C/D and 60 JAS-39E *Gripen* in seven operational squadrons. In October 2021, Flygflottilj 16 'Uppland' in Ärna was also reactivated and will receive its own *Gripen*s in a Stridsflygdivisionen (161st Sqn). The Flygflottilj 16 will have a special mission to protect the Swedish capital Stockholm. The heavily modernized E version will partially replace the current *Gripen* C fleet. The new aircraft has a new AESA (Active Electronically Scanned Array) radar and is powered by a General Electric F414 G engine. It can carry more fuel and weapons. The modernization also includes new weapon systems such as the Meteor missile system. In total, the Flygvapnet has three fighter squadrons, namely Flygflottilj 17 'Blekinge' in Ronneby-Kallinge in southern Sweden, Flygflottilj 7 'Skaraborg' in Såtenäs central Sweden, and Flygflottilj 21 'Norrbotten' in Luleå/Kallas northern Sweden. The names of the fighter wings refer to the respective region and some of the *Gripen* aircraft also bear these names out of affinity.

Sweden became the 32nd member of NATO. The abandonment of its previous neutrality – as well as that of Finland – was triggered by the Russian war of aggression against Ukraine in 2022, which was contemptuous of humanity and international law. Nevertheless, Sweden has also cooperated closely with the armed forces of NATO countries during and after the Cold War. The Flygvapnet regularly took part in major NATO exercises in Europe.

Extensive modernization work is currently still taking place at the home airbase of TaktLwG 71 "R" in Wittmund. For this reason, the squadron flies from Laage AB and also provides the QRA

Before landing, the trainer aircraft of TaktLwG 73 "S" '30+01' made several touch-and-goes with the landing gear extended

Eurofighter '30+58' of TaktLwG 71 "R" on the way to the QRA take-off. The mission took place over the Baltic Sea. There is a camera on the canopy frame to document intercepted aircraft. The aircraft is armed with two live IRIS-T missiles

The main task of Tactical Air Force Wing 73 "Steinhoff" (TaktLwG 73 "S") is the training of all Luftwaffe and Austrian Armed Forces Eurofighter pilots. The squadron therefore has a large number of training aircraft available

During the *Gripen* visit, the EF2000 '31+30' completed its maiden flight with a special paint job on the tail. The 732nd Squadron "Fighting Bulls" is celebrating its 30th anniversary in Laage. In 1994, the squadron moved from Pferdsfeld AB with its F-4F *Phantoms* to Laage AB and was the first unit of the Luftwaffe to convert to the Eurofighter

JAS-39C '37230' of F17 lands after a joint mission. On 7 March 2024, Sweden joined NATO. Since then, Flygvapnet has been increasingly seeking contact with the Luftwaffe

Take-off phase of *Gripens* '39281', '39221', '39232' and '39836' of the Flygflottilj 17. Behind the cockpit is the squadron emblem of the 171st Stridsflygdivisionen, it shows an eagle. In autumn 2002, the unit took over the *Gripen* from the disbanded F10 from Ängelholm and decommissioned its JA-37 Viggen fighter aircraft

After landing, the JAS-39C/D roll back to the parking area at Laage AB. Flygvapnet has ordered 60 new JAS-39 *Gripen* version E from Saab. A total of 120 *Gripen* fighter aircraft are expected to be in service by 2030

With the reunification of Germany, the German Luftwaffe inherited many fighter aircraft from the former LSK/LV of the NVA, including the most modern fighter aircraft, the MiG-29 Fulcrum of the still-existing Warsaw Pact. After reunification, the 24 MiG-29 *Fulcrums* were initially operated at Preschen AB until 1993. The MiG-29 then transferred to the 1st squadron of the newly established JG 73 'Steinhoff' at Laage AB. The various NATO air forces showed great interest in developing and testing appropriate air combat techniques against this fighter aircraft. This was because the MiG-29 was still in service with various air forces. As a result, many different air forces came to Laage with their fighter aircraft to train against the *Fulcrum* and adapt their air combat techniques during the MiG-29's service life. In addition, JG 73 'S' deployed once a year (1999-2003) with up to eight MiG-29s to the USA and Canada for Red Flag or MapleFlag exercises as sparring partners. In 2002 and 2003, JG 73 'S' deployed to Key West/ Florida to fly in the USA against fighter aircraft of the U.S. Air Force, U.S. Navy, U.S. Marines, and U.S. Air National Guard in BFM (Basic Fighter Maneuvering). In the training area over the Gulf of Mexico, the elite pilots of the Top Gun school and US units simulating eastern combat tactics met. The Germans were in great demand as sparring partners thanks to their Soviet design combined with their extensive experience. The *Fulcrum* also flew in Cuba, Syria, Iran, and North Korea at the time. Anyone who expected to encounter the MiG-29 somewhere on an axis of evil wanted to know what they were getting into. The Top Gun operations officer said at the time: 'A German in a MiG-29, that's our worst-case scenario. We're flying against a threat that we hope will never occur in an emergency.' No wonder: a number of the pilots had more than 1,500 MiG flying hours, most of them in simulated dogfights. Even in the motherland of the *Fulcrum* there is not that much experience!

In 2001, Flygflottilj 10 from Ängelholm came to Laage for training against the MiG-29. This commando has a special rarity value, as the Flygflottilj 10 was disbanded in Ängelholm only two years later, although it had only replaced the Viggen in 2000. It was also the first visit of a 'Three Crowns' contingent to Laage.

With the reunification of Germany, the Luftwaffe inherited 24 MiG-29 *Fulcrums* from the LSK/LV of the NVA. Many NATO countries deployed their aircraft to Laage AB to compete with the MiG-29. Here, the MiG-29 '29+20' in a special livery rolls off to a joint mission with Flygvapnet in spring 2001

MiG-29 *Fulcrum* '29+02' assigned to Jagdgeschwader 73 "Steinhoff" (JG 73 "S") at the LCC point. Under the wing, the *Fulcrum* carries a "writer rocket" for recording flight data

▲ MiG-29 '29+01' of JG 73 "S" on the way to a joint mission
▼ JAS-39C *Gripen* '37048' of the F10 on the taxiway

MiG-29UB '29+22' of JG 73 "S". A Swedish pilot is flying in the rear seat. ▲
JAS-39C *Gripen* '39137' of the F10. After only two years with the *Gripen*, this unit was disbanded in 2002 ▼

The pilot with his JAS-39A '39171' was waiting for its next mission in the typical East Shelter area at Laage AB. The tail unit carries the emblem of the F10 from Ängelholm, and the mascot is a ghost. Before the German Reunification, two Su-22 *Fitter* fighter wings (MFG-28, JBG-77) of the NVA were stationed at Laage AB

On each day of the exercise, two rounds were flown from Laage AB with four *Gripen* and MiG-29 aircraft each. The main focus of the program was air combat. JAS-39C '37173' is parked (top) on the shelter apron while '37178' is on its way to take off (bottom)

ROTARY WING MISSION COMMANDER COURSE 2024

ARTICLE BY JORIS VAN BOVEN AND ALEX VAN NOIJE
PHOTOS BY THE AUTHORS UNLESS NOTED

Armée de l'Air et de l'Espace / Emma Le Ruzik

Group photo with the participants of the exercise:
Left side, back to front Armée de L'air with Eurocopter AS332L1 *Super Puma*, Aérospatiale SA330B *Puma*, and Eurocopter AS555AN *Fennec 2*, Right side, front to back Marine Nationale with Aérospatiale AS565SA *Panther* and NH Industries NH90-NFH
Emma LE ROUZIC/Armée de l'Air et de l'Espace

The "Rotary Wing Mission Commander Course" (RW MC Course) is a pivotal exercise for the French Air and Space Force's helicopter units, designed to prepare pilots for high-intensity combat scenarios.

Scheduled from 4-15 November 2024 at Base Aérienne 120 "Commandant Marzac" Cazaux the course is structured into three phases:

1. Academic Week: Candidates receive training on methods for preparing complex missions, in coordination with experts from the Weapons School of the Air Warfare Center.
2. Virtual Week: Future Mission Commanders (MCs) execute several missions in a virtual environment using networked massive simulation tools.
3. Live Exercise (LIVEX): This final phase involves real-world scenarios with various helicopter types (Fennec, Puma, Panther, and NH90), air commandos, intelligence specialists, and medical teams. This year's exercise includes participation from the French Navy's helicopters and crews, enhancing the joint forces component.

Throughout the Live Exercise (LIVEX), Mission Commander candidates are tasked with preparing and leading missions encompassing complex scenarios such as commando infiltration, combat search and rescue (CSAR, RESCO), and evacuation of nationals – embodying the motto of the Brigade Aérienne d'Appui et de Projection (BAAP, Air Support and Transportation Brigade): "Combattre et Sauver" (Fight and Save).

The RW MC Course also serves to develop, test, and standardize technical and tactical skills, and new equipment. The 2024 edition specifically tested the new optical and thermal camera system of the Fennec helicopter, assessing its contribution to high-spectrum missions.

This comprehensive training ensures that future Mission Commanders are well-equipped to lead diverse aerial operations, integrating multiple helicopter types and other assets such as fighter jets, transport aircraft, and drones across all competencies of the Air and Space Force's helicopter component.

LIVEX Media Day

On November 20th, a media day was organized whereby the media was flown in a German KC-130J (based at BA Evreux) from BA Villacoublay (near Paris) to BA Cazaux. After a flight line visit, the KC-130J flew back to BA Villacoublay during sunset.

Participants MISSION COMMANDER 2024

Armee de l'Air

- ◇ Aérospatiale SA 330 Puma
- ◇ Eurocopter AS332 Super Puma
- ◇ Eurocopter AS550 Fennec (2 helicopters)
- ◇ EADS CASA CN-235

Marine Nationale

- ◇ Eurocopter AS565 Panther
- ◇ NHIndustries NH90 Caïman

A French Air Force AS55AN *Fennec* assigned to EH 01.065 hovers past a French Navy NH90-NFH *Caïman* assigned to 33F and a French Air Force SA330B *Puma* assigned to GIH

The Helicopters are being made ready for the next mission

Main: French Air Force SA330B *Puma* and French Navy NH90-NFH *Caïman* (left to right)

Left: French Air Force AS332L1 *Super Puma*

Right: French Navy NH90-NFH *Caïman*

This AS55AN *Fennec* of the French Air Force has just taken off while the AS565SA *Panther* of the French Navy waits with running rotors for its taxi clearance

French Navy NH90-NFH Caïman assigned to 33F at Lanvéoc/Poulmic

French Navy AS565SA *Panther* assigned to 36F at Hyères/Le Palyvestre

Insets: French Air Force AS332L1 assigned to ET 03.067 at BA 107 Villacoublay

Above: French Air Force SA330B *Puma* assgined to GIH (Groupement Interarmées d'Hélicoptères), a joint forces helicopter unit in support of the anti-terrorist team of the Gendarmerie.

New Fennec cameras

The new optical and thermal camera system on the Fennec helicopters is a cutting-edge technology upgrade aimed at enhancing the helicopters' mission capabilities in both day and night operations.

1. Enhanced Surveillance and Targeting:
   - ◇ The system integrates high-resolution optical cameras and thermal imaging sensors, providing superior visibility across diverse environmental conditions.
   - ◇ It allows the detection and identification of targets at long ranges, including during poor visibility or nighttime.
2. Thermal Imaging:
   - ◇ Infrared (IR) capabilities enable the detection of heat signatures from personnel, vehicles, or other objects, making it particularly effective for search and rescue (SAR), reconnaissance, and target acquisition missions.
3. Multi-Spectrum Observation:
   - ◇ Combines visual spectrum cameras with thermal sensors, offering real-time imaging that overlays data for detailed situational awareness.
   - ◇ Capable of tracking multiple objects simultaneously.
4. Stabilization and Precision:
   - ◇ Advanced stabilization systems ensure clear images even during high-speed maneuvers or turbulence.
   - ◇ Precision targeting aids in guiding weapons or assessing threats accurately.

During the Rotary Wing Mission Commander (RW MC) Course 2024, the optical and thermal camera system on the Fennec helicopters will be tested in:

- ◇ • High-spectrum missions: Evaluating the system's performance in detecting and engaging threats in complex, multi-faceted scenarios.
- ◇ • Integration with other assets: Assessing its contribution to missions involving coordination with other helicopters (e.g., Puma, NH90), air commandos, and intelligence units.

Left: French Air Force AS55AN *Fennec* assigned to EH 01.065 at BA115 Orange
Top right: The *Fennec* can be equipped with a 7.62 mm door gun
Bottom right: This picture shows the Fennec's new optical and thermal camera system

Photo-flight **(main image: left to right, inset: bottom to top)**
French Air Force with Eurocopter AS555AN *Fennec 2*, French Navy with Aérospatiale AS565SA *Panther*, French Air Force Aérospatiale SA330B *Puma* and French Navy-NFH.
All photos this page by Emma LE ROUZIC/Armée de l'Air et de l'Espace

All images this page Armée de l'Air et de l'Espace / Emma Le Ruzik

WORLD DEFENSE SHOW

4-8 FEBRUARY 2024 AT RIYADH, KINGDOM OF SAUDI ARABIA

معرض الدفاع العالمي
المملكة العربية السعودية
4-8 فبراير 2024

WORLD DEFENSE SHOW
SAUDI ARABIA
4-8 FEB 2024

REPORT BY WOLFGANG JARISCH

An eye-catcher in the middle of the exhibition area were a Royal Saudi Air Force Tornado IDS, an F-15C, an F-15S, and a Eurofighter Typhoon painted in the beautiful green of the national color and with special markings

Almost exactly one year ago, the largest International Defense Exhibition in the world took place in the Kingdom of Saudi Arabia. As preparations for the third edition of this event are already in full swing and 50% of the exhibition space has already been allocated, we would like to take a brief look back at this gigantic event.

When we talk about the world's largest International Defense Exhibition, there is probably only one place in the world that can really be considered large and where the global elite from business, politics, and armaments meet, namely the WORLD DEFENSE SHOW in Riyadh, Saudi Arabia.

Here is how the organizer describes the venue

World Defense Show is held within a contemporary world-class facility that has been designed to ensure the ultimate visitor experience. The venue provides an immersive event through dynamic show features and displays housed in purpose-built areas that showcase a wide range of products of all sizes.

Spanning 800,000 sqm, the venue comprises three large exhibition halls, outdoor exhibit spaces, a land demonstration track, a runway, and space for static aircraft displays.

In addition, the venue will deliver versatile networking areas, on-the-floor conference spaces, and hospitality outlets to entertain, connect, and unlock business leads and opportunities for exhibitors and visitors to the show.

The venue is located about 80km north of Riyadh and is easy to reach by car or with free buses provided by the organizer.

Opening of the World Defense Show 2024 in Riyadh

The Minister of Defense and Vice Chairman of the Board of Directors of the General Authority for Military Industries (GAMI), Prince Khalid bin Salman bin Abdulaziz, inaugurated the 2nd edition of the World Defense Show 2024 in Riyadh, which was held under the patronage of the Custodian of the Two Holy Mosques, King Salman bin Abdulaziz Al-Saud, on behalf of His Royal Highness Prince Mohammed bin Salman bin Abdulaziz Al-Saud, Crown Prince, Prime Minister of the Kingdom of Saudi Arabia, and Chairman of GAMI's Board of Directors.

During the opening ceremony, Prince Khalid, the defense ministers and senior officials viewed the flight demonstrations and static display. The Minister also toured the exhibition, as well as numerous government agencies and leading local and international companies from the defense and security sector.

GAMI wrote on its website "This royal support for the exhibition underscores the Saudi leadership's commitment to hosting a world-class event that ranks among the best defense and security exhibitions in the world." It also reaffirms Saudi Arabia's ambition to become a global hub for the organization of exhibitions in all fields. The Governor of GAMI, Ahmad Abdulaziz Al-Ohali, thanked the Custodian of the Two Holy Mosques and His Royal Highness Prince Mohammed bin Salman bin Abdulaziz for their unwavering support.

This support strengthens the Kingdom's strategic independence and supports the ambitious goals of Vision 2030, which aims to localize 50% of defense spending, Al-Ohali explained. He noted also that the Kingdom has started to reap the benefits of this support, with localization rates increasing from 4% to 13.6% at the end of 2022.

Moreover, 477 foundational permits and licenses have been issued for 265 companies operating in the defense industries sector, and over 74 investment opportunities have been provided for supply chain localization, noted Al-Ohali.

Royal Saudi Air Force E-3A *Sentry* AWACS assigned to 18 Squadron

He said that the sector's contribution to the GDP is expected to reach approximately SAR 93.75 billion by 2030. The sector is also expected to contribute an estimated total of 40,000 direct and 60,000 indirect job opportunities.

This information shows the importance of this event for the Kingdom of Saudi Arabia and the local economy. In addition, it must be said that Saudi Arabia is also opening very strongly to tourism and is really becoming a popular vacation destination, where you feel really welcome as soon as you arrive at the airport.

"WOMEN IN DEFENSE" This part needs a brief mention

Her Royal Highness Reema bint Bandar Al Saud, Ambassador of the Kingdom of Saudi Arabia to the United States, chaired the "WOMEN IN DEFENSE" program at the World Defense Show 2024.

His Royal Highness, Ambassador Reema bint Bandar Al Saud, emphasized the Kingdom's commitment to promoting the contribution of women in all areas, especially in defense and security, even before the start of WDS 2024. As part of the Saudi Vision 2030, she highlighted the progress that has been made within this framework, which is specifically committed to the empowerment of women and their inclusion in the Saudi workforce and society. These efforts have already paved the way for numerous success stories of women who have excelled in various roles, the ambassador said. This program has an impact to positively change gender equality throughout the Middle East, a rather conservative region, and the ambassador also explained that such initiatives can even create a global momentum in the male-dominated areas, which would be desirable.

With the launch of the "VISON 2030" program in 2018, the Saudi royal family triggered a revolution of positive change not only in their own country but also in the entire Middle East. This was the starting signal to integrate women into the world of work and in security-related areas. There are now clear successes to report throughout the region. Jana Sader became the first female fixed-wing pilot in Lebanon; Sabaa Thnaibat became the first female F-16 pilot in the Jordanian Air Force; Sheikha Aisha bint Rashid Al Khalifa became the first female fighter pilot in Bahrain; Sara Sabry became the first Egyptian woman in space; and Saudi Arabian Rayannah Barnawi became the first Arab female astronaut. They all testify to a growing openness to questioning established gender norms.

The Show itself

We cannot report on the entire event here, as that would go beyond the scope of this report. That's why we want to give you a small view into the world of aviation, missiles, and drones.

The static display was dominated by military aircraft, but a Boeing 787-10, an Airbus 320 Neo, and an Airbus 321 Neo from Saudia found a place among the fighter planes and drones. To the west of the civilians stood an aircraft that is now rarely seen, namely the new Ilyushin Il-76MD-90AE. It was very hectic around this proven transporter, as many African delegations visited this aircraft. Next to it was the flagship from Brazil, the Embraer KC-390 Millennium, which was also very popular with visitors. And on the same panel, visitors were able to see two drones for themselves. Namely the successful model from Turkey, the Bayraktar Akinci (Prototype PT-7), which was fully armed for the display. The manufacturer Chengdu Aircraft Industry Group, which belongs to the AVIC Complex (Aviation Industry Corporation of China), presented the export model of its Wing Loong-10B (WL-10B) drone, also with a wide range of weapons systems made in China. The WL-10B will also be included in the Royal Saudi Air Force's inventory.

Royal Saudi Air Force A330-202MRTT assigned to 24 Squadron

The Saudi armed forces naturally showed pretty much everything they had in their inventory in the static display. The Royal Saudi Air Force brought in addition to their giants such as the Boeing E-3A Sentry and the Airbus A-330 MRTT, their fighters to the WDS. In the beautiful green of the national color and with special markings, a Tornado IDS, an F-15C, an F-15S, and a Eurofighter Typhoon were on display in the middle of the exhibition area. These green aircraft were a real eye-catcher on the apron. In addition, the Air Force was also represented with a Eurocopter EC-225 Super Puma and a brand-new BAe Hawk 165 in the new livery of the Royal Saudi Hawks in the static display. The Royal Saudi Army was represented with a Boeing CH-47F and a Sikorsky UH-60M Black Hawk, and the Saudi Arabian National Guard (SANG) brought a Boeing AH-64E Apache Guardian and a rarely seen Boeing AH-6i Little Bird. An AW-139 from the Saudi Medevac and an Airbus H-145T-2 from the Saudi State Security attended the show. The Royal Saudi Naval Forces were represented by a Sikorsky MH-60R Seahawk in the static display, one of ten examples acquired by the Royal Saudi Naval Forces in 2018 and mainly used for anti-submarine warfare.

Between the Saudi helicopters were two international guests, namely the brand new NHI NH90 NFH of the Qatari Air Force, a Sikorsky S-70A Black Hawk from the U.S. Army, and an Agusta Westland AW-159 Wildcat AH1 of the Uk-Army.

There were also international aircraft to see, such as the latest version of the JF-17 Thunder, namely the JF-17C (Block III), developed and produced by Chengdu-Pakistan. The Block III is the most modern variant of the JF-17 and is equipped with, among others, an EASA radar as well as a 3-axis digital fly-by-wire flight control system, an infrared search and track system, and a helmet-mounted display and sight system, a larger HUD, and an advanced missile approach warning system. Also from Pakistan, the MFI-395 Super Mushshak, produced by PAC Kamra and equipped with the latest avionics, was on display. This is now a successful model which is used as a basic trainer in many air forces around the world. Twenty of them are in the inventory of the Royal Saudi Air Force. The French, who had a Dassault Rafale on display during the first two days of the show, are also hoping to do business in the Arab world. The Royal Air Force was there with the Airbus A-400M Atlas.

The USAF had an impressive presence at WDS 2024 and therefore, had a lot of material in his luggage. According to 'air boss' Col. Andy Ladd of the USAF, "building trust is the backbone of being able to work together as a coalition from multiple countries." Two C-130J Super Hercules were on display, one of which came from Little Rock AFB and brought a rock band with it. The band created a really good rock atmosphere on the apron. The venerable Fairchild A-10C Thunderbolt II could be seen in the static show as in the daily flying program too. Rarely seen on public display is the Bombardier E-11A. Rarely seen on public display. This aircraft is part of the Battlefield Airborne Communications Node (BACN), operated by the 430th Expeditionary Electronic Combat Squadron (EECS). The E-11A is based at the Prince Sultan Air Base in Saudi Arabia. From the New Jersey ANG was a General Dynamics F-16C Fighting Falcon in the static display.

As in the previous two years, the daily flying display was only scheduled for a maximum of two hours. The Pakistani Air Force made its international debut with the JF-17 Thunder (Block II) of the No 18 Squadron Sharpshooters from Pakistan Air Force Base Bholari. In addition to the A-10 Thunderbolt II, an F-16C from the US Air Force was also represented in the Flying Display. The U.S. Navy showed a Boeing P-8 *Poseidon* in a flypast on two days. The Royal Saudi Air Force was represented in the Flying Display with an F-15SA and a Eurofighter Typhoon. The national display team, the Saudi Hawks, could not be missing either.

U.S. Navy P-8A *Poseidon* assigned to VP-9

The Chinese Air Force brought the national display team on 1st August to the WDS and showed the audience that China is at the forefront when it comes to military precision flying. Also, the Turkish Stars were not to be missed, as the two countries Turkey and Saudi Arabia maintain very close relations.

In addition to the flying display, there were also daily land displays, which we will not go into in detail in this report. In addition, the static display was really well filled with all kinds of armored vehicles, buggies, unmanned vehicles with autonomous navigation systems, and many more special vehicles up to the Heavy-Duty Missile Launcher.

When it came to drones, it felt like every drone manufacturer in the world was represented. From mini drones to high-flying reconnaissance drones and heavy-lift drones, there was an incredible wealth of everything the market has to offer. The Saudi Prince Sultan Defense Studies and Research Center (PSDSRC) also exhibited the latest developments of its UAVs in the outdoor area, including the now well-known Skyguard, or the Qaswaa with a 15m wingspan and two hardpoints, or the somewhat smaller and futuristic-looking Shaheen, which was exhibited with smart ammunition. MARSS was once again at WDS this year with its Interceptor MR killer drone, which is said to be on the verge of series production. The Saudi company Wakeb, specializing in artificial intelligence, machine learning, cognitive computing, smart applications and software, presented its new Khataf UAS and showcased its AI capabilities. BAE-Systems T-650 heavy-lift UAS, unveiled in the fall of 2021 and shown at the World Defense Show 2022 in a configuration for anti-submarine warfare with a Sting Ray light torpedo, was shown this year in the CASEVAC role. The South African manufacturer Milkor brought its flagship, the Milkor 380, to the WDS. And when it comes to drones, Turkey must be mentioned. Everything Turkey has to offer in terms of drones was represented, including Baykar, Aselsan, and STM. We're making a cut here because reporting on drones alone would take up a whole magazine.

The guided weapons manufacturers, missile producers, bomb manufacturers, and ammunition suppliers were not to be missed either. In view of the fact that there is a worldwide shortage of ammunition, good business can be expected in these areas in particular. Countries such as Pakistan are also entering the global stage for this market. For example, Global Industrial & Defense Solutions (GIDS) from Pakistan presented the new Fatah II long-range guided missile for the first time in public, the first test of which took place on 27 December 2023. The Saudi National Company for Mechanical Systems (NCMS) made its first public appearance with its lightweight Air Drop Bombs, which are primarily intended for Class 1 UAS. These are just a few examples of the countless innovative products that can be seen at the WDS.

Some key facts compared to 2022

2022 – Over 600 exhibitors from 42 countries

2024 – 773 von 76 countries

2022 – More than 100 international delegations and more than 65 000 trade visitors

2024 – 441 Delegations 106 000 Trade Visitors

2022 – 29,7 billion SAR of orders and announcements.

2024 – 26+ billion SAR of orders and announcements and more than 40 MOU and cooperation agreements.

The Aviation Magazine would like to thank GAMI and the press officers for their great support during the preparation, the entry into the Kingdom of Saudi Arabia, and the support on-site. We are back in February 2026 for the next edition of the WDS.

AgustaWestland AW139 used by the Saudi Ministry of Defense for MedEvac

Royal Saudi Air Force Airbus Helicopters H215 (Eurocopter AS332 *Super Puma*)

Royal Saudi Air Force (RSAF) Airbus Helicopters H215

Turkish Air Force A400M *Atlas* assigned to 221 Filo

Turkish Air Force A400M *Atlas* assigned to 221 Filo

French Air Force Rafale C. After the WDS was transferred to Croatia that purchased 12 Rafales from France in 2022 for their Air Force

Royal Saudi Air Force Typhoon F2 assigned to 80 Squadron

Royal Saudi Air Force Typhoon F2 assigned to 80 Squadron

F-16C Block 30-CF assigned to 121st FS of the U.S. Air National Guard District of Columbia

Pakistan Air Force JF-17 (Block-II) *Thunder* assigned to 18 (OCU) Squadron

Pakistan Air Force JF-17 (Block-II) *Thunder* assigned to 18 (OCU) Squadron

Pakistan Air Force JF-17 (Block-II) *Thunder* assigned to 18 (OCU) Squadron taxiing towards the runway while a Chengdu J-10C *Vigorous Dragon* fighter jet of the "August 1st" national aerobatic demonstration team of the People's Liberation army Air Force rolls down the runway after landing

"AUGUST 1ST" – PEOPLE'S LIBERATION ARMY AIR FORCE – CHENGDU J-10C *VIGOROUS DRAGON*

"TURKISH STARS" – TURKISH AIR FORCE – NORTHROP F-5 *TIGER II*

Northrop F-5F
Tiger II

Northrop F-5E
Tiger II

"Turkish Stars" of the Turkish Air Force and "Saudi Hawks" of the Royal Saudi Air Force

"SAUDI HAWKS" – ROYAL SAUDI AIR FORCE – BAE HAWK Mk.65

STATIC DISPLAY

▲ Royal Saudi Land Forces Boeing CH-47F *Chinook*
▼ Royal Saudi Naval Forces Sikorsky MH-60R *Seahawk*

Royal Army Agusta Westland AW-159 Wildcat AH1 ▲
Qatari Emiri Air Force NHI NH90 NFH ▼

▲▼ Saudi Arabian National Guard (SANG) Boeing AH-64E *Apache Guardian* ▲▼

xxx
xxx

U.S. Army UH-60M *Black Hawk*

Royal Saudi Land Forces UH-60M *Black Hawk*

The Royal Saudi Air Force applied the "Vision 2030" color scheme to a Typhoon (left), an F-15 (right), and a Tornado (top)

▲ Royal Saudi Air Force F-15S assigned to 55 Squadron
▼ Royal Saudi Air Force Hawk Mk.165 assigned to Hawk IFKA

Royal Saudi Air Force F-15S assigned to 55 Squadron ▲
Royal Saudi Air Force Hawk Mk.65 assigned to88 Squadron/Saudi Hawks ▼

▲ Ilyushin Il-76MD-90AE
▼ Royal Air Force Airbus Atlas C1

Ilyushin Il-76MD-90AE
Turkish Air Force Lookheed C-130EM *Hercules* assigned to 222 Filo ▲ ▼

The Bayraktar Akıncı is a high-altitude long-endurance (HALE) unmanned combat aerial vehicle (UCAV) being manufactured by the Turkish defence company Baykar

The Wing Loong-10 drone – military designation WZ-10 is a High-Altitude Long Endurance (HALE) UAV, featuring some stealth characteristics. In 2017, it was developed by the Chengdu Aircraft Industry Group for reconnaissance and precision strike missions

▲ Thales offers the Watchkeeper X, designed for ISTAR applications, now in a weaponized version

▼ MARSS Interceptor MR killer drone

▲ Lentatek Karayel-Su advanced maritime patrol UAV

▼ Russian Orlan 10E reconnaissance drone

ITALIAN JET AB INITIO TRAINING - PART II

ARTICLE BY MARO MUNTZ AND WIEBE KARSTEN

The Aeronautica Militare received 30 MB-339CDs in two batches from December 1996. Twenty-seven of them (designated T-339C in Italian military service) are believed to be still operational, all are assigned to 61° Stormo at Galatina

Maintaining the fleet

With the arrival of the MB-339A in the 80s, a new system of technical support was created for maintenance units focused on a single type of aircraft. On 1 August 1981, the 10° Reparto Manutenzione Velivoli (RMV) or Aircraft Maintenance Division was established exclusively for the MB-339 fleet to conduct 1st and 2nd level inspections. The 3rd level was the major overhaul, also known as Inspection and Repair As Necessary (IRAN), and was carried out by either 10° RMV or manufacturer Aermacchi at Venegono.

Nowadays, all MB-339 versions are subject to four maintenance levels. Both the 1st and 2nd intermediate levels are done by 961° Gruppo Efficienza Aeromobili (GEA) or Aircraft Efficiency Unit. The 10° RMV is in charge of 3rd-level maintenance while Leonardo takes care of the IRAN, the 4th-level inspection. In addition to the first two maintenance levels, GEA provides training of personnel, quality control of procedures and equipment as well as checks and maintenance of on-board safety equipment. GEA is also responsible for logistics and ground support to facilitate the daily flight activity. The 1st level will be performed after 150 flight hours and is called 'Hourly Post Flight Inspection' (HPFI). The HPFI lasts about one week and includes visual inspections on every part of the aircraft, checks on avionics, instruments and the engine as well as a landing gear inspection. The 2nd level is carried out after every 250 flight hours and takes about two months. This periodic inspection will see more in-depth maintenance, like Non-Destructive Examination (NDE) on vital parts of the aircraft including wings and landing gear. Additionally, avionics and electronic equipment will be checked. Also, the engine will be removed and transferred to the engine test room. Here, the engine will be thoroughly examined by borescope, and parts will be cleaned or replaced whenever needed. In particular, the engine's combustion chamber and the first two stages of both the compressor and turbine are maintenance sensitive due to wear and possible damage from ingestion of foreign objects (FOD). A test bed is available to check the engine's performance after maintenance. When activities are completed, the engine is re-installed to perform a couple of engine runs, which will either be done by RMV or GEA in a special run-up area.

The 10° RMV is complementary to the GEA for higher-level maintenance and is in charge of a fleet of more than 40 MB-339 aircraft, including all MB-339A/PAN versions operated by the Frecce Tricolori demonstration team. In particular, the RMV takes care of the 3rd level maintenance, which is among the most complex as this requires the whole disassembly of the aircraft. The RMV also performs 2nd level maintenance to stay current, they decide whether an aircraft gets inspected by them or GEA. The 3rd level will be done after 500 hours of flight, lasting three to four months. During this inspection, the engine will be removed and thoroughly checked. Further on, electronic equipment like radios and avionics will be opened and examined. Defect or expired internal parts of a specific instrument, either mechanical or electronical, will be replaced and tested before re-installation or stored for future use. After 2,000 flight hours, the MB-339s will be sent to the Leonardo factory at Varese-Venegono for their IRAN. During this inspection, the aircraft is completely

The 961° GEA is responsible for the first two maintenance levels of the MB-339 fleet. For easy access to the MB-339's Viper engine, the complete empennage can be removed. Clearly visible are two pushing rods to control the aircraft's elevator and rudder.

disassembled, and each part is checked, cleaned, and replaced whenever necessary. The Rolls-Royce Viper engine will be sent to Piaggio Aerospace in Villanova d'Albenga for general overhaul. At the end of this level, the aircraft will be freshly painted after which a compass swing and engine runs are conducted. If the engine tests are satisfactory, the aircraft will be released for multiple test flights, performed by Leonardo company test pilots. After a successful acceptance flight made by 61° Stormo pilots, the MB-339 is taken back to Galatina AB. The MB-339 is now clearly showing its age as several spare parts are getting more difficult to obtain. However, both 10° RMV and 961° GEA are still using parts removed from retired MB-339 'Alphas' for the CD models, in addition to the complete engine. This enables the largest possible number of serviceable aircraft that can be assigned for day-to-day training. Thanks to the efforts of both maintenance divisions, between 25 to 30 missions can be flown every day, which equals more than 10,000 annual flight hours.

Birth of the MB-339 'Alpha'

The MB-339A was born following a requirement of the Aeronautica Militare Italiana (AMI) in the early seventies for a new jet trainer meeting the latest training criteria to replace both the Aermacchi MB-326 and Fiat G-91T. In collaboration with the Aermacchi design office, led by engineer Ermanno Bazzocchi, two different projects were compared and evaluated. The first project comprised six newly designed aircraft, each layout was defined by a different type of engine and aerodynamics, known as the MB-338 family. Run in parallel, the MB-339 project included two different models based on the MB-326 airframe, each one with a different engine installed. In February 1975, the MB-339V (Viper) model, driven by the Rolls-Royce/ Fiat Viper Mk.632 engine, was selected as being the most suitable and cost-effective solution for future basic and advanced training. A significant change in comparison with its predecessor, the MB-326, was the raised rear ejection seat to enhance visibility for the instructor. Structural improvements included reinforced wings while a larger tail section and two ventral fins contributed to directional stability. A modern cockpit featured innovative instrumentation and radio navigation equipment. Initially, two MB-339A prototypes and one static airframe were constructed. The first prototype, MM588, made its maiden flight from the Aermacchi factory at Venegono on August 12, 1976. A pre-series of fifteen MB-339s was ordered and soon the AMI expressed a requirement for 100 aircraft. Following the maiden flight of the first pre-series MB-339A in July 1978, the AMI formally accepted the initial two aircraft on August 8, 1979. The first four MB-339s were transferred to Pratica di Mare for an extensive pre-operative test campaign, which was carried out by the Reparto Sperimentale di Volo (RSV) between September 1979 and June 1980. In less than nine months, almost twelve hundred missions were completed, accumulating over 1470 flight hours, with overall satisfying results.

Deliveries to Galatina

At the time, the Scuola Basico Volo Iniziale Aviogetti (SBVIA) or Initial Basic Flying School at Lecce-Galatina disposed of a large fleet of MB-326/Es,

An MB-339CD is seen retracting its landing gear after getting airborne from Galatina's Runway 14 for an early morning training flight

operated by 212° and 213° Gruppo. 212° Gruppo was the first squadron to make the transition onto the new jet trainer. The initial four MB-339As arrived at Galatina on 8 April 1981. 213° Gruppo started its conversion two years later, in 1983. In the beginning, the aircraft were used to train instructors and to verify and improve the MB-339 training syllabus developed by the RSV. Also, ground support personnel and technicians had to be made familiar with the new jet trainer. The type was officially inducted into service on 1 October 1981, when training activities commenced. Corso 'Urano III' students from the Accademia Aeronautica were the first ones to do the full course on the MB-339A, starting in August 01982. The first 24 MB-339s assigned to the SBVIA were painted in a white and orange color scheme, nicknamed 'Marlboro', referring to the cigarette brand (four from the pre-series and twenty from the second batch). The latter consisted of 40 MB-339s including 14 aircraft for Frecce Tricolori which formally made the conversion from the G-91PAN to the MB-339A/PAN (Pattuglia Acrobatica Nazionale) on 27 April 1982. As preparation, pilots and technicians from the team were trained at Galatina between November 1981 and February 1982. The final six aircraft of the second batch were again delivered to Galatina, albeit in a camouflage scheme due to the type's newly assigned secondary task in the close air support role. The two-tone dark sea grey/dark green NATO camouflage, added with high-visibility 'dayglo' orange markings, became the standard livery. The third batch initially consisted of 45 aircraft but in August 1981, the Stato Maggiore, or Italian Air Force Headquarters, decided to reduce the number to 26 for budgetary reasons. Deliveries started in May 1983, however, in March 1984, the Stato Maggiore re-thought the deal and negotiated with Aermacchi to procure another 20 aircraft which were delivered from January 1986. The MB-326s were gradually replaced and re-assigned to various flight support units throughout Italy to substitute the Lockheed T/RT-33As. A class of Italian Naval pilots was the very last to graduate on the MB-326 'Macchino' in May 1984. The retirement of the MB-326 also meant the closure of the Scuola Centrale Istruttori Volo (SCIV) at Grottaglie and the training of future instructors was transferred to SBVIA. On 14 September 1986, SBVIA was officially re-designated 61° Brigata Aerea (BA) as a result of major changes in the organizational structure to enable the command of three squadrons. Subsequently, all MB-339s lost their two-digit individual number and received a wing-related (61-) code on the rear fuselage instead. The third squadron under 61° BA command became 214° Gruppo Istruzione Professionale (GIP) or Professional Instruction Squadron, which was re-established on 8 September 1987. 214° GIP was allocated the ground school and flight instructor training but got no aircraft assigned. Three MB-339A/RMs (Radio Misure), which had been operated by 14°Stormo as a calibration platform since February 1981, were withdrawn in September 1987 and transferred to 61° BA. From the autumn of 1990, low-visibility markings were applied to the MB-339 fleet while from 1994, all aircraft were repainted in an overall sky grey colour scheme during major overhaul. In the first half of the nineties, six additional MB-339As were built as attrition replacements. The final MB-339A, MM55059, was delivered to Galatina in 1995, bringing the total number of aircraft for the AMI to 107, in addition to both prototypes.

Mid-Life Upgrade

An update program for the MB-339A was initiated in mid-1999 with the scope to extend the jet trainer's service life from 10,000 to 15,000 flight hours

MB-339CD '61-155' is about to touch down at Venegono with the Monte Rosa massif nicely visible in the background. The aircraft was used to ferry a pilot to pick up another MB-339CD after major overhaul in December 2023

by implementing structural improvements and new avionics. The upgrade of 70 MB-339As was envisaged but this was later reduced to 50 aircraft. The avionics upgrade was concentrated on the installation of a Litton Italia (now Northrop Grumman Italia) Attitude and Heading Reference System (AHRS), integrated with a GPS receiver to increase navigation accuracy. The associated AHRS/GPS control panel incorporated various navigation modes and a digital display. Further cockpit changes comprised a new AN/ARC-150(V) VHF/HF HAVE QUICK secure radio for enhanced communication and a radio switch on the control stick to confirm landing gear extension. Other improvements included the installation of higher capacity batteries connected in parallel, a g-load measurement system, an Elmer crash data recorder, an emergency locator transmitter (ELT), low-intensity formation lights (nose, wingtip, and rear fuselage), and anti-skid brakes. The MLU variant also had corrosion-resistant materials implemented. In addition, a throughout revision of the technical regulations and procedures was made leading to new maintenance standards. The entire MLU project was estimated at 110 billion Lire (55.2 million USD). The MB-339A/MLU prototype, CSX54453, first flew on 20 December 1999. The MLU upgrade started in 2001 and was carried out by Aermacchi at Venegono when aircraft arrived here for major overhaul. In total 50 MB-339As were upgraded to MLU standard, one prototype, 32 MB-339As for 61° Stormo, and 17 MB-339A/PANs for 313° Gruppo (Frecce Tricolori). The MB-339A conversion program was completed in 2009 while an additional eight MB-339A/MLUs were converted to PAN standard afterwards.

61° Stormo

Galatina's flight school structure was adjusted to the level of Stormo, hence 61° Brigata Aerea was transformed into 61° Stormo on December 1, 1995. The AMI ordered an initial batch of 15 MB-339CDs (Completamente Digitale – Full Digital) in mid-1995, equipped with modern avionics which included a mission computer, head-up display (HUD), HOTAS (hands-on-throttle-and-stick) controls, and three Multi-Function Displays (MFDs). Between August 1997 and November 1998, 13 MB-339CDs were delivered to 61° Stormo and assigned to 212° Gruppo. Final Operational Capability (FOC) on this type was achieved in October 1998. In August 2001, a contract was signed for a further 15 MB-339CDs, designated MB-339CD2 (2° lotto – batch). The CD2 is an improved version with additional capabilities such as a moving map display and embedded threat simulation. Fourteen were added to 212° Gruppo, the squadron received six aircraft in the second half of 2002 while the remaining eight were supplied during 2003. Fourteen CDs from the first order were upgraded to Batch 2 configuration between 2008 and 2010 when the aircraft were overhauled at Venegono. The first two modified aircraft returned to Galatina in March 2009. From 2002, the MB-339A/MLU variant gradually replaced the MB-339A operated by 213° Gruppo. Most of the non-upgraded aircraft were retired to serve as spare sources, while six were converted to MB-339NAT by Alenia-Aermacchi for the United Arab Emirates aerobatic team 'Al Fursan'. As an advanced 4th generation trainer with a modern pilot-aircraft interface, the MB-339CD was perfectly suitable for pre-operative training of both navigators and pilots destined to operate front-line combat aircraft (AMX, Tornado, and Eurofighter). 212° Gruppo became responsible for Lead-In to Fighter (LIFT) training, initially only available to Italian students. The high value of these LIFT courses, the possibility to offload front-line training, and the international aspiration of Galatina's flight school did not go unnoticed abroad. Bilateral agreements were signed with various Air Forces of allied and partner countries to send both students and instructors to Galatina for LIFT training. When 212° Gruppo was assigned the Slow Mover Interceptor (SMI) role, instructors needed to be trained on both tactics and procedures for this new type of mission. The terrorist attacks on 11 September 2001 highlighted the importance of protecting Italian airspace from slow-moving aircraft, helicopters, or drones causing a potential threat. Aerial patrols were carried out by MB-339CDs armed with two AIM-9L Sidewinders and two pylon-mounted DEFA 30mm gun pods. In order to keep the instructor pilots qualified, Dissimilar Air Combat Training (DACT) was conducted every six months, in addition to participation in both national and NATO exercises.

The international character of Galatina's flight school and pre-operational training of future fighter pilots called for a more suitable logo referring to 61° Stormo's training activities. On 10 May 2015, a ceremony was held at Galatina to present the new 61° Stormo crest. The penguin, which had been representing the 'Scuola di Volo' since 1946, gave

Left: One of the last classic MB-339 Alpha's operated by 214° Gruppo is '61-106'. The aircraft taxies to its parking position after a local training sortie in April last year
Right: An MB-339CD is about to leave its parking spot for yet another flight

The very last MB-339 Alpha to receive major overhaul by Leonardo aircraft division was MM54465. The aircraft is seen on final approach to Runway 35 at Venegono in January 2020 at the conclusion of a post-maintenance flight

way to an eagle with spread wings protecting Diana's Bow. The latter had already been used by the Regia Aeronautica's Scuola Caccia (fighter school) at Castiglione del Lago in the 1930s. The new emblem coincided with two major changes, the arrival of the Leonardo T-346A advanced jet trainer and the introduction of a new syllabus based on IPTS 2020 (Integrated Pilot Training System). The IPTS 2020 was adopted by the Comando Scuole dell'AM in January 2014 and subsequently, the training program was adapted to its current structure. Phase I and II were combined in a single Phase on the SF-260EA, comprising an initial screening and elementary training to issue the Brevetto Pilota Aeroplano (BPA). The next stage was Phase II track selection on the MB-339A/MLU, carried out by 214° Gruppo. As a direct result of IPTS 2020, 214° GIP transformed into a Gruppo Volo on 10 December 2015. After its re-establishment as a flight squadron, 214° Gruppo was assigned all MB-339A/MLUs previously operated by 213° Gruppo. The squadron became responsible for both Pilot Instructor Training (PIT) courses and Phase II. Phase III was changed into specialized training to issue the Brevetto Pilota Militare (BPM). 213° Gruppo kept in charge of Phase III, however, only to train students assigned to the fighter track (Linea Caccia). Since May 2016, the Remotely Piloted Aircraft track (Linea APR – Aeromobili Pilotaggio Remoto) was added to Phase III, a dedicated course designed for future drone pilots. In February 2015, 212° Gruppo received the first of eighteen Leonardo T-346As, gradually replacing its MB-339CDs which were passed on to 213° Gruppo. The final T-346A was delivered in early January 2018. The advanced jet trainer is part of an Integrated Training System (ITS) which includes a related ground-based segment.

Two T-345As are making a low pass at Venegono prior delivery to Pratica di Mare on December 19, 2023. Here, the Reparto Sperimentale di Volo carried out the acceptance phase before delivery to 61° Stormo one year later

Future 61° Stormo T-345A CSX55251 shortly before landing at Venegono's Runway 35 after a test flight in January 2023. This particular aircraft received tactical code 61-211 and has been assigned to 214° Gruppo recently

Construction works at Galatina for the Ground Based Training System (GBTS) facilities had already started in 2010. The very first Phase IV LIFT course on the T-346A, attended by four Italian students, began in September 2015. After the transition onto the T-346A, 212° Gruppo lost the Slow Mover Interceptor (SMI) task. Instead, 212° Gruppo was assigned the Aggressor role, making their debut as 'Red Air' during the TLP 2016/1 course at Albacete, Spain. The LIFT syllabus offered by 61° Stormo attracted an increasing number of foreign countries to train their future combat pilots on the T-346A. The Italian Air Force and Leonardo established the International Flight Training School (IFTS) in 2018. Between February and October 2019, four Leonardo-owned T-346Bs were added to the 212° Gruppo fleet. To enable further expansion and to create more space at Galatina for the M-345 integrated training system, 212° Gruppo/IFTS relocated to Decimomannu on the island of Sardinia. In December 2020, work started here to build the new campus and related facilities. The first courses at Decimomannu were launched in July 2022 while five months later, in November, the IFTS was officially inaugurated at its new location. The final LIFT course at Galatina was completed in early June 2023 when a class of Qatari student pilots graduated.

Another step in the modernization process of 61° Stormo was the arrival of the first two T-345As at Galatina in December 2020. Both aircraft were subject to an Operational Test and Evaluation (OT&E) phase, ahead of the type's induction into service by

One of the major changes compared to the first M-345 prototype, was a larger canopy to fit two Martin Baker Mk.IT16D ejection seats. Also, the aircraft's jet intakes were adapted to the new Williams FJ44-4M turbofan engine

214° Gruppo. A team from the RSV, Comando Scuole, and Leonardo was in charge of the OT&E which began in January 2021. In an early-stage technical issues with the aircraft's gear system were identified which needed to be addressed by manufacturer Leonardo first. As a consequence, Operational Test and Evaluation (OT&E) was temporarily suspended and further deliveries were put on hold. Almost three years later, on 19 December 2023, two T-345As of the second batch were assigned to the RSV for further evaluation and pre-operative tests prior to delivery to 61° Stormo one year later, on 16 December 2024. The next day, two more T-345s were assigned to 61° Stormo after having been ferried from factory airfield Venegono.. Following instructor training, the release of the new syllabus, and the availability of more T-345As, Phase II training on the new type will commence. So far, eighteen M-345s have been ordered with a requirement for up to 45 aircraft to cover both Phase II and Phase III, gradually replacing the MB-339CD fleet. On 1 December 2020, 61° Stormo celebrated its 25th Anniversary in which more than 200,000 flight hours were accumulated and almost 700 military pilot licenses were issued to both Italian and foreign students from more than 10 different countries. In those 25 years, 61° Stormo has been transformed into an international flight school equipped with the latest advanced technologies and jet trainers to better prepare student pilots for frontline tactical roles operating 4th and 5th generation combat aircraft. During the last decade, Galatina's flight school has become a fine example of today's formation process of military pilots in Europe and beyond.

The authors would like to thank Major François, Major Oscar and the Communications Section of 61° Stormo for their time and support in preparing this article.

As the issues with the nose wheel steering and main gear brake system have been solved, deliveries of the T-345 to 61° Stormo have now resumed

A M-345 is about to touch down at birthplace Venegono during sunset. The aircraft's profile clearly reveals its predecessor, the SIAI-Marchetti S-211

SANICOLE AIRSHOW 2024

ARTICLE BY JORIS VAN BOVEN
AND ALEX VAN NOIJE

Boeing B-17 «Sally B» Flying Fortress. It is the only airworthy B-17 in Europe and is part of the Imperial War Museum Duxford. It was delivered to the U.S. Army Air Force on 19 June 1945, after the end of WW II in Europe. It was flown back to the U.S. and modified to TB-17G and used for training purposes. In 1949 it was allocate the EB-17G status and served as a research aircraft until 1954 when it was returned to the B-17G standard configuration

This year, the 44th edition of the International Sanicole Airshow took place on 21 and 22 September 2024. The air show is traditionally held at Leopoldsburg airport in the north of Belgium. In addition to the civilian participants, the ties with the Belgian Air Force are also clearly visible in the flight program.

History

The Sanicole airshow at the airport of Leopoldsburg (Belgium) has grown from a small event to a true spectacle over the years. The name Sanicole has a special background and has nothing to do with he location of the event. The name Sanicole was invented by the Belgian Lucien Plees. He is the founder of the flying club at Leopoldsburg airport in the municipality of Hechtel-Eksel in northern Belgium. Mister Plees was the owner of a sanitary facility in Korpsel at the time of its foundation. The name Sanicole is a combination of the word sanitary and the name of his daughter Nicole. When the Sanicole Airshow was held for the first time, the event did not represent much. The size of the show contrasted sharply with what the event is today. The air show started to grow in size when Gilbert Buekenberghs started to interfere with the organization. In the 1980s, the Sanicole Airshow grew into a large air show that earned its place in the list of leading air shows. This was quite a special achievement at the time because almost all successful air shows in Europe were not commercial at that time. Most air shows are usually organized by the Air Force or another branch of defense in most countries. The first international participants to participate in the Sanicole Airshow came from countries such as the Netherlands, France, and England. The Sanicole Airshow soon became the brand of an international airshow and the name was changed to International Sanicole Airshow (abbreviated: ISA). The ISA is nowadays one of the most important airshows that is held annually in Belgium.

The Sanicole Airshow has long been a household name in Belgium. However, it would take until the 90s for the air show to break through internationally as a big name in the world of air shows. The Sanicole Airshow remained the only annual air show in Belgium after tightening up safety rules. People have not been idle in Belgium over the years because the Sanicole Airshow has become a leader internationally when it comes to safety, quality, and innovation in the aviation world. In 2010, the organization received their biggest reward so far: The Sanicole Airshow was then named the best European air show and was rewarded with the Paul Bowen Award by the European Airshow Council. Since 2011, the Sanicole Sunset Show is also held annually. This sunset event is held annually on the Saturday night before the Sunday daylight show. During this show, the spectators can photograph and film during the sunset. Over the years, the Sunset Show has also developed into a full-fledged event. During this air show, traditionally many flares and also fireworks are used by the planes and helicopters. Against the often dark skies and the weak evening light, this results in spectacular photos for those present. If lucky, the moon will also show itself during the setting, making the result even more beautiful. The planes and helicopters that participate in the Sanicole airshow usually fly from the Kleine-Brogel military airbase not far from Leopoldsburg. Leopoldsburg does not have the right infrastructure and as a result, many military aircraft cannot fly from this airport.

On the Sunday of the show, an even larger daylight airshow will be held.

Overflight of a B-17 with the bomb bay doors open

The Battle of Britain Memorial Flight

On 2 September 2024, a media trip was organized by the Sanicole airshow to visit RAF Coningsby for interviews with the BOBMF Lancaster crew

The 'Battle of Britain Memorial Flight' is known for its evocative aerial displays, showcasing the historical significance of these flying legends. It is not just about preserving the past, but it's equally about honoring the sacrifices of the aviators who flew these iconic aircraft during the Second World War. The queen of the fleet is the world-famous Avro Lancaster of the Battle of Britain Memorial Flight (BBMF), which is a four-engine heavy bomber that dominated the night skies during the Second World War. With its imposing wingspan and powerful engines, the Lancaster was a formidable force, delivering devastating payloads to strategic targets across Europe. During Operation MARKET GARDEN, the daring Allied airborne invasion of the Netherlands in 1944, Lancasters played a crucial role in attacking key targets in advance of the planned parachute droppings. The Avro Lancaster was an appreciated participant in the International Sanicole Airshow in Belgium. The appearance of this legend of aviation is a large contribution to the commemoration of the 80th anniversary of both the liberation of the region around Hechtel-Eksel, where the Sanicole Airshow took place and the sacrifices made by those taking part in Operation MARKET GARDEN over The Netherlands.

Squadron Leader Marc ‘Suggs’ Sugden has been a part of the BBMF for more than four years but is since the season of 2022 the head of this remarkable unit. Mark flew on fast jets throughout his flying career and has successfully managed to avoid a desk job: "My first assignment was on the Tornado F3 at RAF Leuchars in Scotland with No 43 Squadron. I flew here for four years before joining the British training world. I was an instructor on the Hawk T1 and later also on the Hawk T2. I spent a total of five years at RAF Valley in Wales as an advanced flying training instructor. After this, I moved on to the Typhoon. I’ve flown on the Typhoon since 2013 and flew that for almost ten years prior to taking command of the BBMF." Marc explains about the Lancaster: “The Avro Lancaster really made her mark in RAF Bomber Command and is probably most famous for the part that she played in the Dambusters raid. That raid was of a format that I don't think the Air Force will ever see again. An unproven bomb that was taken against all the odds into the Ruhr and into the industrial heartland of Germany, to drop what was an unproved, ingenious, design from Barnes Wallace to try and breach the dams in the German river valleys. Our Lancaster is the only one flying in Europe. And here in Lincolnshire where it is based, she is made all the more special by being in the heart of what we know as Bomber County in the United Kingdom. Back in the 1940s, Lincolnshire was littered with Bomber Command air bases. From where I stand now, here at RAF Coningsby, within a ten-mile radius, I could name you ten Bomber Command bases that were used during thousands of bomber raids night in, night out during the latter parts of the Second World War. Therefore, this ground feels as her spiritual home and the community here has very close ties to bombers, most notably the Avro Lancaster. The aircraft is super, super special. The Lancaster is something I'm very proud of that we are still in today, and I really hope you all enjoyed the sight of at the International Sanicole Airshow."

Avro Lancaster B Mk.1, built in May 1945. This Lancaster is the only one of two airworthy bombers and belongs since November 1973 to the Battle of Britain Memorial Flight

Main: xx
Left: xx
Right: xx

Fouga CM-170R Magister, civil registration NX216DM, served with the Belgian Air Force with serial MT-5 from February 1960 until Sptember 1979. The *Magister* flew with the Belgian Air Force demo team 'Red Devils'

2024 edition
This year there was again a sunset airshow on Saturday evening and a big show during the day on Sunday. There were 2 themes this year:

- 80 years of liberation was the theme of the 44th Sanicole show
- 50 years of the first flight of the GeneralDynamics F-16

The evening show on Saturday started with the flight of the WW2 RAF Lancaster from the Battle of Britain Memorial Flight as the end of the 2nd World War played a major role in Belgium. The area around Sanicole airfield was liberated by the Allies in early September 1944, after which this area formed the starting point for the further operation MARKET GARDEN in the Netherlands, targeting the Arnhem bridge ('too far'). In the air show, this was emphasized on Saturday evening by presenting two WW2 bombers: the Avro Lancaster and the Boeing B-17.

As the sun sank further and further to the horizon, demos were given by

- The Swiss 'Patrouille Suisse' in their Northrop F-5, decorated with the '60 years' patch
- The USAF VIPER demo pilot in the F-16, for the only demo in Europe in 2024
- The French demo pilot MIMOUSS in the Dassault Rafale
- The Finnish Air Force F-18 demo
- The Danish F-16 demo
- Richard Goodwin in his Pitts S2S with 2 additional jet engines
- The Swedish Air Force US-60 helicopter, popping flares

When the sun was set, the fireworks demos were given by:

- The Flying Dragons from Poland with 8 gliders filled with fireworks
- The Alternative Duo from France in their two RF-4D Fournier aircraft with fireworks
- The AeroSPARX - Air Display Team from the United Kingdom
- Bob Grimstead from the United Kingdom in n his Fournier RF-4D Redhawk

The day show on Sunday also contained many references to the 2nd World War. The Boeing B-17 and the Lancaster came along again,followed by a Spitfire.

Various demo teams gave their demonstrations:

- The Patrouille Suisse in the F-5
- The Patrouille Suisse in the F-5
- The USAF VIPER demo pilot in the F-16
- The Turkish SOLOTURK in the F-16
- The Danish F-16 demo
- The Finnish F-18 demo
- The German Eurofighter
- The special D-Day decorated British Eurofighter named 'MOGGY'
- The Slovenian PC-9
- The Swedish UH-60 (no flares on Sunday)
- The Red Devils in the SF260, probably with their last demo ever, although it is not sure yet
- The civil Fouga Magister
- The civil P-40 Warhawk

Flyby's were performed by

- The Belgian A400M
- A formation of 3 Belgian F-16s from Kleine-Brogel
- The Belgian A400M
- A formation of three Belgian F-16s from Kleine-Brogel
- A formation of five F-16s with former Belgian demo pilot VRIESKE in the lead, followed by twoPortuguese F-16s, the Turkish SOLOTURK F-16, and the Danish demo F-16
- A formation with a Spitfire and 1 Belgian F-16, with former Belgian demo pilot VRIESKE

Main Finish Air Force F/A-18C *Hornet* assigned to HävLLv-31
Inset Royal Air Force Typhoon FGR4 assigned to No 29 Squadron. The aircraft had the 2024 season special color scheme that represented the 1944 era 'day fighter' scheme with black-and-white 'invasion stripes'

French Air Force Rafale C assigned to ETR 03.004 with the 2024 season's special color scheme

Left Belgian Air Force three-ship formation of two F-16AMs and one F-16BM
Right Royal Danish Air Force F-16AM assigned to EWS
Above Turkish Air Force F-16C solo team 'Solotürk' assigned to 123 Filo

USAF F-16 demopilot 'FEMA'

Q: Can you introduce yourself?
A: My name is Captain Taylor Hiester (callsign FEMA). I'm the commander and pilot of the American F-16, Viper demonstration team. We are super honored to be here at the Sanicole Airshow in Belgium. This is our first and only European performance this year. We're here to celebrate our NATO partnerships, as well as the 50th anniversary of the F-16.

Q: Can you tell me about the demo itself?
A: The training to become the demonstration pilot is a seven-month process. I was really fortunate to be trained by the previous demo pilot. And that upgrade process is about 19 flights, to get trained up, to be able to fly the performance for everybody. It's a very demanding demonstration. I'm pulling nine G's for a good part of the maneuver. It's about 15 or 16 minutes of pure speed and G-Forcesv.

Q: What do you expect to see here at Sanicole after your demo?.
A: There There are several F-16 displays that you will see today, and I find it interesting to watch how each country flies. Some air forces fly what I would call a slower but more, high, AOA alpha, demo. Where the F-16 demo from the United States is, is more speed and rolls.
It's very interesting to see the difference in displays, but you'll get a really good look at the airplane all day long today.

Q: Do you talk to the other demopilots?
A: Yeah, we do. I'm really looking forward to seeing the demonstrations from the other teams and sharing our love of the F-16, especially this year for the 50th anniversary. Our jet this year is our heritage airplane that is painted as the 1974 YF-16 with red, white, and blue colors.
We couldn't bring it to Europe this year because it is a big logistical problem to transfer F-16s across the ocean. But we are lucky to have the support of the United States Air Forces in Europe, supporting us with their airplanes.
Q: Where does the F-16 demo team stand from the US perspective?
A: So goal as a team is to inspire people to serve their community. And that's why we're here celebrating our NATO partnerships and the F-16 itself. We hope that everybody coming to this airshow will be inspired. Not just by our performance but by all of the performances here today to become involved in aviation, to serve their community, whether they consider that to be, their town, their nation, whether they want to serve in the military or not.
We just believe that aerial demonstrations like the one that we put on make people see what it's like to achieve peak human performance with a group of people and want to be part of a team like that, whether that's serving in the community or something else
Q: And about yourself, what is your own background with respect to planes that year?
A: I took my first airplane lessons when I was nine years old. And I've been really lucky to fly ever since. I started flying for the American military in 2016, and I've been flying ever since. I was lucky enough to be selected for the F-16 and to be the demonstration pilot for the 50th F-16 anniversary for America.
It is a dream come true.

U.S. Air Force F-16C *Fighting Falcon*

Belgian Air Force SF260M+ assigned to Competence Center Air

Swedish Armed Forces Helicopter Wing A109LHUS (Light Utility Helicopter System), Swedish desgination Hkp.15A/B. Sweden has a total of 20 AW109s, of which 12 are the Hkp.15A utility variant ('inland') and eight are the SAR variant (maritime) Hkp.15B. This helicopter here is Hkp.15A and is assigned to 2.Hkpskv

Swedish Armed Forces Helicopter Wing UH-60 *Black Hawk*, Swedish desgination Hkp.16A, assigned to 2.Hkpskv. Sweden has a total of 15 Hkp.16As

Patrouille de Suisse leader Major DUFT

Q: Can you tell us something about yourself?
A: I am Major Michael Duft (callsign 'Püpi'), leader of the Swiss Air Force demo team Patrouille Suisse. I joined the team in 2015, so this is my 10th season. Before that, I flew the F-18 in the 11th Squadron (Tigers) out of Meiringen AB.
I have a total of 2,450 hours of flight experience, with about 800 hours on the F/A-18 and 800 hours on the F-5. An interesting point to note is that, traditionally, all Patrouille Suisse pilots were qualified F-5 pilots. I was the first to join the team without prior experience on the F-5. Since my entry, every new member has transitioned from the F/A-18 to the F-5. Now, I am the oldest and most experienced member of the team.
The F-5 is very easy to fly, with straightforward and direct controls, which makes formation flying especially enjoyable. And, of course, it is a fighter jet, it's incredibly fast.

Q: What do you like about the Patrouille Suisse, what we have to bring to you and to the rest of the world?
A: At the end of the day, it's all about teamwork. It's not just about me as the leader; it's about all of us working together. It doesn't matter if I'm leading or if I'm flying as number 2 or 3 on the right or left. The key is teamwork and trust – trusting each other. We fly just three to five meters apart, depending on the formation, so we place our lives in each other's hands. That level of trust makes it incredibly special.
It's especially meaningful when we're abroad, like here in Sanicole, representing Switzerland. It's a tremendous honor for me personally, and I believe for all Patrouille Suisse pilots, to represent our country internationally.

Q: How many shows did you fly this year?
A: Normally, we fly around twelve to fifteen shows per year, with about ten in Switzerland and four or five abroad. The last show abroad this year will be here at Sanicole, Belgium. The very final show of the 2024 season is always during the famous Lauberhorn downhill ski race in Wengen, which takes place in January of the following year. Despite being in January 2025, it officially marks the end of the 2024 season.

That show will also be my very last one flying with the Patrouille Suisse.

Q: What will you do after leaving the Patrouille Suisse in January 2025?
A: After my last show with the Patrouille Suisse, I will continue flying the F-5 as part of RED AIR (opposing forces) and remain active in the Swiss Air Force.

Q: Another pilot and you will be leaving the Patrouille


Maj M. Duft

Suisse, who will be your replacements?
A: Both Mac (#4) and I (#1) will be leaving the team. As a team, we select our newcomers ourselves; no one tells us who will fly with us. Each active team member has a say in the selection, and any member can veto a candidate, a decision that is respected immediately.
We already have two newcomers in the team: 'Mosi' and 'Moe.' Mosi had the chance to accumulate some flight hours on the F-5 and flew the spare plane to the Sanicole Airshow. He's already part of the team but will officially fly during the demo season next year. The other newcomer, Moe, completed his transition course on the F-5 during July and August. Both of them are qualified on both the F-5 and F-18.
Next year, they will join the flying team. To help them integrate, we have planned a special extra week during our training course, giving them additional hours to focus on specific details of our demo routines.

Q: Can you tell us more about the 60th anniversary?
A: This year marks the 60th anniversary of Patrouille Suisse. We began in 1964 with Hawker Hunters as a four-ship demo team during Expo 1964. In 1978, we flew abroad for the first time, in France. That same season, a fifth Hunter was added, and by the end of 1978, we were performing six-ship Hunter shows a tradition that continued until 1994. In 1994, the F-5 was introduced to Patrouille Suisse, equipped with an integrated smoke system.
Each year, we strive to improve our program, but it largely depends on the team's experience. When we have a stable team over several years, we can enhance our demonstrations. However, if there are significant changes with many newcomers, we simplify the routines and focus on the basics. That said, spectators on the ground usually can't tell the difference between a new team and an experienced one.
So, there may be a slight downgrade for about a year until the whole team is fully integrated, after which we can start making improvements again.

Q: How long will the F-5 be available for the Patrouille Suisse?
A: Officially, we have the F-5 until 2027, after which there is a deadline due to international regulations. These involve upgrades to radios, ejection seats, and other critical components that must be updated for us to continue flying within European airspace. At the moment, it's unclear if there will be a budget for these updates, so for now, we consider 2027 as the final year of the F-5 for Patrouille Suisse.
The only thing we can do is continue delivering safe and excellent demonstrations, as we always have. That's what we can control as a Swiss team – doing the best job possible, which serves as the best advertisement for us.

Q: Can you tell us more about the new F-35s and your role here?
A: I will definitely be part of it, although it's not yet decided in which role. Regarding the F-35, some infrastructure in Switzerland needs to be updated. Dedicated buildings need to be constructed and certified for operational use of the F-35, and some of these construction projects are already underway.

Q: Can you tell me about the Sanicole airshow?
A: Sanicole is always a very nice and well-organized airshow. While it's smaller compared to larger events like the British RIAT or the Austrian Airpower shows, its organization is top-notch. Because of this, they consistently attract excellent demo teams from across Europe, which makes it special for us as pilots.
This is my fourth or fifth time here, and it's always a pleasure to be in Belgium.

Q: Anything else you want to say?
A: Being part of the Patrouille Suisse is a huge honor for me. It means the world to me because it's all about the team and the trust we have in each other.

Royal Danish Air Force F-16AM assigned to EWS

This and next page: Spectacular sunset show of a privately owned G-109B

THE AVIATION MAGAZINE

Since 2009 we bring you the BEST for FREE Aviation Magazine