

THE AVIATION MAGAZINE

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№ 69 May-June 2020
Volume 11, Issue 3



- **Belgium Says Goodbye to its Alpha Jets**
- **U.S. Air Force at Osan AB, Korea**
- **Japanese Samurai Phantoms**
- **Turku Airshow**
- **And so much more ...**

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www.TheAviationMagazine.com

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Cover: NH90 TTH of the Spanish Army during exercise BACCARAT 2019, © 2019 Martijn Venix

This page: MiG-21MF of the Romanian Air Force at the NATO Days at Ostrava, Romania © 2019 Peter Thivessen



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THE AVIATION MAGAZINE

by www.TheAviationMagazine.com

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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.

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NEWS FROM THE EDITOR

It is incredible how the world has changed since the last issue of THE AVIATION MAGAZINE two months ago. The COVID-19 virus not only affects our daily life. Also the impact on aviation and major events is dramatic. Airshows, exercises, open days, photo-calls, press events and much more are either cancelled or postponed indefinitely. For THE AVIATION MAGAZINE, this means that we will be working more intensively on last year's events. However, we promise our readers interesting reports with great photos like this issue's report on the last F-4 Phantoms of the Japanese Air Self Defense Force, a visit to the U.S. Air Force Base Osan in South Korea or the report on the helicopter exercise BACCARAT. And much more.

In the next issue, we will be in Europe, South America and again in Asia. Let us surprise you!

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Thank you very much for reading and downloading THE AVIATION MAGAZINE.

I wish you all the best and stay healthy.

Ralf Peter WALTER
Publisher & Editor

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BELGIUM SAYS GOODBYE TO ITS ALPHA JETS

REPORT AND PHOTOGRAPHY BY KRIS CHRISTIAENS AND GERT TRACHEZ

On Monday, January 12, 2020, the last three Alpha Jet 1B trainer jets of the Belgian Air Force (Belgian Air Component) returned from France to the Beauvechain Air Base in Belgium for the last time. This brings an end to the era of the successful trainer aircraft of the Belgian Air Force and the cooperation with France for advanced jet pilot training. For many former and operational pilots of the Belgian Air Force, this aircraft has a special place in their hearts since it was the first jet they flew with. Due to the great success of this aircraft, the Alpha Jet is often called 'the best trainer jet of Europe'.

A successor for the T-33A and Fouga Magister

In 1973, the Belgian Government decided to purchase 33 Dassault-Breguet/Dornier Alpha Jet trainer jet aircraft to replace the aging Lockheed T-33A and Fouga Magister trainer aircraft. With the search for a successor to the Lockheed F-104G Starfighter in the early 70s, the Belgian Air Force also looked for a new third-generation trainer jet. The Alpha Jet turned out to be the best choice. This training and tactical-support twin-jet tandem two-seater was the first aircraft produced jointly by Dassault Aviation, Breguet

Air-to-air in 2017 with the Alpha Jet AT-10 of the Belgian Air Force. Photo: Kris Christiaens





Aviation of France, and Dornier Flugzeugwerke of Germany. The Alpha Jet was originally designed for the French Air Force and the German Air Force. Many other countries such as Nigeria, Egypt, Cameroon, Morocco, Togo, Ivory Coast, and Belgium acquired the Alpha Jet. The final contract between the Belgian Government and the manufacturer was signed in September 1975 and these aircraft were designated Alpha Jet 1B. The assembly of the 32 aircraft was carried out by SABCA at their facilities in Gosselies, Belgium after which the aircraft entered service with the 7th Squadron and 11th Squadron. The Belgian Air Force Eventually received its first Alpha Jet (AT01) in October 1978. The last Belgian Alpha Jet (AT33) was delivered in July 1980. In the following years, the Sint-Truiden/Brustem Air Base became the home base of these trainer jets as the 7th Squadron and 11th Squadron were located there. The paint shop of the

Sint-Truiden/Brustem Air Base was also responsible for their typical 'Vietnam' color scheme. When the Sint-Truiden/Brustem Air Base was closed in 1996, the Alpha Jets moved to the Beauvechain Air Base.

Advanced Jet Training School (AJeTs)

From 2000 onward, the Belgian Alpha Jets went through a modernization program by SABCA (Alpha Jet 1B Plus). This mid-life update provided the aircraft with a head-up display, GPS-navigation, and other advanced avionics to extend the operational lifetime. Due to overcapacity of modernized Alpha-Jet aircraft of the Belgian Air Force, a minimum quota of Belgian student pilots and a shortage of training aircraft of the French Air Force, the Advanced Jet Training School (AJeTs) was established in 2003. This unique training

school was created by the former Belgian and French defense ministers André Flahaut and Michèle Alliot-Marie. The Advanced Jet Training School (AJeTs) was based at Cazaux Air Base in France. From 2005 on, all Alpha Jets of the Belgian Air Force were detached at this airbase. Originally, the training took place in Tours (France) with the second part in Cazaux (France) but from 2013 on, the entire training took place at Cazaux Air Base. While it was decided to train the future Belgian jet fighter pilots in France, the maintenance of the Alpha Jets of the Belgian Air Force was carried out at the Beauvechain Air Base in Belgium. For all the pilots of the Belgian Air Force, the Cazaux Air Base in France played a very important role in their career. After their initial flight training at Beauvechain Air Base, the young Belgian pilots continued their training at Cazaux Air Base with the Alpha Jet 1B. They finally received their aviator

badge or 'pilot wings' after five months of training with the Alpha Jet 1B, after which they could move on to become a fighter pilot, pilot of a transport aircraft or helicopter pilot within the Belgian Air Force. To become a fighter pilot, they received additional training for nine months at Cazaux Air Base with the Alpha Jet 1B trainer jet in which they learned the first combat techniques.

During the 42 years the Belgian Air Force operated the Alpha Jet, four aircraft were lost due to accidents. In 1980, AT04 crashed near Nalinnes in Belgium as a result of the loss of speed during an aerobatics flight, killing one pilot. The second accident happened in Germany (Feldberg) on November 22, 1984, when AT07 came in contact with a radio tower on Mount Feldberg in driving snow. Both Belgian pilots ejected but did not survive. Two other Alpha Jets, AT09 and

Alpha Jets are being prepared to participate in the military parade during the Belgian National Day.
Photo: Kris Christiaens



AT16, crashed near Bierbeek in Belgium after a mid-air collision on April 19, 1999. Both pilots ejected to safety.

Popular jets

The Alpha Jet 1B trainer aircraft of the Belgian Air Force was always very popular among photographers and aircraft spotters across Europe. This may be because these aircraft were often shown at the Beauvechain Air Base as well at airshows and other aviation events in Belgium, France, and other European countries. A traditional moment of the year to admire the Belgian Alpha Jets was during a military parade in Brussels

at the Belgian National Day. Over the years, many of the Belgian Alpha Jets were given special color schemes such as the beautiful 'Batbird I' and 'Batbird II' in reference to the 11th 'Bat' Squadron. Others were to celebrate milestones such as 20 years Alpha Jet in Belgium, 10 Years AJeTs, and 1.000.000 flying hours with the Alpha Jet 1B. Several of the Alpha Jet 1B's were also used to demonstrate its performance and maneuverability at numerous national and international airshows. In addition, the many Belgian Air Force pilots, the King of Belgium (Philippe of Belgium) and the Belgian astronaut Frank De Winne also received an advanced jet training with the Alpha Jet.

End of an era

On Thursday 11 October 2018, a closing ceremony took place at Cazaux Air Base in France which officially closed the Advanced Jet Training School (AJeTs). After fifteen years, the Belgian Air Force can look back on a very positive cooperation with the French Air Force. This cooperation permitted both countries to benefit from a more efficient and cost-related training program for their pilots. Thanks to this Belgian-French training school 165 Belgian and 215 French pilots received an advanced jet pilot training. After closing the Advanced Jet Training School (AJeTs) at Cazaux Air Base in 2018, it was decided to train future Belgian pilots at the Euro-NATO Joint Jet Pilot

Training (ENJJPT) school. This multinational training school is part of the 80th Flying Training Wing of the U.S. Air Force and is based at the Sheppard AFB in Texas. The Euro-NATO Joint Jet Pilot Training Program in Texas is a well-proven formula that is used today by Belgium, Canada, Denmark, Germany, Greece, Italy, Norway, Portugal, The Netherlands, Spain, Turkey, United Kingdom, and the United States. Every year, this facility welcomes about 200 student pilots from all participating nationalities to fulfill their advanced jet training on the Beechcraft T-6 Texan II and the Northrop T-38 Talon. Twenty-five of the remaining Alpha Jet 1B's of the Belgian Air Force are now being put on sale and therefore may have a second life.

AT19 somewhere over Belgium.
Photo: Gert Trachez



- The Alpha Jet AT29 at the Tactical Weapon Meet at the Florennes (inset - photo by Kris Christiaens)
- The Alpha Jet 1B AT28 flying over the Ardennes in 2016 - (main image - photo by Gert Trachez)



The Alpha Jet AT20 during a special sunset and night photoshoot in 2016 at the Beauvechain airbase.
Photo: Kris Christiaens



▲ AT32 with the '1.000.000 flying hours' special color scheme - Photo: Gert Trachez
▼ AT21 at the maintenance hangar of the Beauvechain airbase - Photo: Kris Christiaens



AT14 carrying a centerline-mounted gun-pod - Photo: Gert Trachez
AT30 at the maintenance hangar at the Beauvechain airbase - Photo: Gert Trachez



NATO DAYS AT OSTRAVA

REPORT AND PHOTOGRAPHY BY WOLFGANG JARISCH AND PETER THIVESSEN



Seventeen NATO countries were on display at the biggest security show in Europe. The NATO Days took place at Ostrava Leoš Janáček Airport / Mošnovonce, Czech Republic, again in combination with the Czech Air Force Days. The annual show was held on 21 and 22 September 2019. Around 220,000 visitors followed the organizers' call and enjoyed this unique event under perfect weather conditions.

As announced during her official visit in Prague on 15 March 2019 by the Romanian Prime Minister Viorica Dancila, Romania took on the role of a Special Partner Nation of this year's NATO Days & Czech Air Force Days. Both countries celebrated 100 years of bilateral diplomatic relations, NATO's 70th anniversary and 30 years since the fall of communism. Also, the Czech Republic celebrated 20 years of its NATO membership.

It was a great opportunity for the visitors to watch the performance of the rarely seen MiG-21MF *LancerR* fighter. The Romanian Air Force also demonstrated the IAR 99 Soim trainer aircraft, a product of the Romanian company Avioane Craiova and the IAR 330L SOCAT *Puma* in the dynamic display, while one MiG-21MF *LancerR* and a C-27J *Spartan* was shown in the static display.

The Americans sent the big stuff to the event. They brought a KC-135R *Stratotanker* from the Nebraska Air National Guard, a B-52H *Stratofortress* from the 307th Bomb Wing, Barksdale AFB, and for the first time, the upgraded C-5M *Super Galaxy* from the 433rd Airlift Wing, Joint Base San Antonio-Lackland, Texas to the NATO Days 2019. The belly of the C-5M *Super Galaxy* harbored Bell helicopters UH-1Y *Venom*

and one AH-1Z *Viper*, the future helicopters of the Czech Air Force. The Czech Government will buy eight UH-1Y utility and four AH-1Z combat helicopters. The helicopters will be armed with AGM-114 Hellfire missiles and M197 20 mm machine guns. Two other giants in the static display, a NATO E-3 AWACS and an Airbus A400M Atlas of the German Air Force, complemented the US giants.

Immediately after ending a series of ground tests, the Aero Vodochody L-39NG made its public debut at the NATO Days 2019. Not only the public could admire this plane, but also interested customers had the opportunity to convince themselves of the next-generation aircraft within the Aero Vodochody family. The L-39NG could also be a good option for the Austrian Air Force to replace their aging Saab

105. This generation of the L-39NG allows air forces to complete their basic pilot training before switching to other systems such as the Eurofighter. The aircraft could also be used for light attack or close air support missions. Aero Vodochody is looking for customers with a smaller budget who cannot afford a 5th generation combat aircraft fleet. Let us wait and see who the first customer will be.

For the first time in its 19-year history, three aerobatic teams performed at the NATO Days. For the first time at Ostrava, visitors could see the Patrouille de France with eight Alpha Jets. The French team performed only on Saturday. The Swiss Air Force PC-7 Demo Team together with the Swiss F-18 *Hornet* and the Finnish Air Force Midnight Hawks performed their program on both days. The Midnight Hawks, with

Public debut of the Czech Aero Vodochody L-39NG trainer aircraft



their four Hawks Mk.51, flew in perfect formation, sometimes at a very low altitude, while the Swiss Air Force PC-7 Demo Team started their display program when the F-18 Hornet joined the formation. It was very impressive to watch the nine propeller-driven aircraft together with the powerful F-18 Hornet.

The Czech Air Force presented a wide variety of its Air Arm in the sky, like a powerful solo display

from a Saab J-39C *Gripen* and a pair of L-159 *Alca*'s flown by pilots of the 222nd Tactical Squadron from Čáslav who demonstrated a strike ground attack with massive pyrotechnic effects. Helicopter solo displays were flown by a Mil Mi-2 *Hoplite*, a Mil Mi 24V *Hind*, and an Enstrom 480B. One of the highlights of the Czech Air Force was the formation flight of an Extra 300SR, flown by Martin Sonka, together with a Saab JAS39C *Gripen* piloted by Cpt. Ivo Kardos. This was

definitely an amazing display. From the early years of the jet age, the Mig-15 UTI was admired as well as modern types, such as the Typhoon from the Royal Air Force and the F-16's from the Dutch or Norwegian Air Force. Both countries brought specially painted F-16's to the NATO Days.

Extensive static and ground displays made this edition of the NATO days once again a complete

success. Also, the perfect traffic planning on arrival and departure must be highlighted. Enough food was available for the physical well-being of the visitors.

The authors would like to say thank you to Andrea Čerovská and her team for the great support.

This Slovak Air Force MiG-29AS is assigned to the 1. Bojová Letka of the Tactical Wing at Sliac AB



Royal Air Force Typhoon FGR4 (above)

Swiss Air Force F/A-18C Hornet (main image)

Czech Air Force JAS39C Gripen (above)





- Swiss Air Force CL-604 (top left)
- Czech Air Force Yak-40 (middle left)
- Czech Air Force L-410UVP-E20M (top right)
- Royal Netherlands Air Force G-IV (bottom left)
- Polish Air Force M-28B/PT (bottom right)



Czech Air Force JAS39C Gripen
and Extra 300SR



Royal Norwegian Air Force F-16BM (left) and F-16AM (right)



German AF Tornado IDS (left) Italian AF Tornado ECR (right)



Royal Netherlands Air Force F-16AM (left and right)





Romanian Air Force MiG-21MF



Italian Air Force AMX (left & right)



Romanian AF IAR-99C (left)
Czech Air Force L-159 (right)



Austrian Air Force PC7 (left)
Belgian AF Alpha Jet 1B+ (right)





Czech Air Force L-159 ALCA



- Lithuanian Air Force C-27J (top left)
- Slovak Air Force C-27J (left)
- Romanian Air Force C-27J (right)
- Czech Air Force C295M (main image)



▲ French Air Force A400M *Atlas*
▼ U.S. Air Force C-5M *Galaxy*



NATO E-3A *Sentry* AWACS
U.S. Air Force KC-135R *Stratotanker* ▼ ▲





Czech Air Force Mi-35 Hind



▲ Czech Air Force W-3A
▼ Czech Air Force W-3A and Mi-17



Romanian Air Force IAR330L SOCAT ▲
Slovak Air Force UH-60M Blackhawk ▼





Czech Air Force Mi-171Sh







BELGIAN BALTIC AIR POLICING

REPORT AND IMAGES
BY JORIS VAN BOVEN
AND ALEX VAN NOYE



In January 2020, a media flight was organized by NATO Allied Air Command and the Belgian Air Force to visit the Belgian detachment at Šiauliai Air Base.

The commanding officer of the Belgian Air Force

detachment at Šiauliai AB in Lithuania briefed the media on the Belgian Baltic Air Policing. In 2004, the Belgian Air Force was the first NATO Air Force to participate in the Baltic Air Policing program. Since September 2019, the 349 Squadron from

Kleine-Brogel AB, Belgium is one of two NATO nations tasked with air policing over the Baltics. The other one is Poland. The Polish Air Force deployed F-16s to Ämari AB in Estonia. After tensions in northern Europe and the Crimea increased, Šiauliai AB and Ämari AB

were added to the Baltic Air Policing program in 2014. The Baltic Air Policing program is under control of the NATO Allied Air Command based at Ramstein AB, Germany. For Baltic Air Policing, the overall control of the Baltic Air Space is coordinated from the Combined

As the alarm goes off, the pilot and a maintainer hurry to the aircraft.

Air Operations Centre (CAOC) Uedem in Germany which controls the complete airspace of northern Europe. The Control and Reporting Center (CRC) at Karmėlava in Lithuania directs the Baltic Air Policing aircraft to their targets.

The Belgian detachment is at 24 hours, 7 days a week readiness with two aircraft. Within a maximum of fifteen minutes after being alerted (scrambled), two F-16s armed with live weapons are airborne. This is called the Quick Reaction Alert (QRA). Two additional F-16s are kept as spare aircraft at high readiness as well.

The Belgian detachment consists of a 'lean' group of only 60 personnel, split into three branches

- the operational branch: pilots and mission planners, also some firefighters and a meteorologist
- the maintenance branch: maintenance personnel for the F-16s for avionics and weapons
- the support branch: medic, military police, and one fighter-controller at the Control and Reporting Centre at Karmėlava (LT).

The Belgian F-16s are loaded with two AIM-120 AMRAAM anti-aircraft missiles (beyond visual range), two AIM-9 Sidewinder anti-aircraft missiles (within visual range) and one M61A1 six-barrel Gatling gun with some 500 rounds. Next to the radar, the targeting pod ('Sniper' Advanced Targeting Pod (ATP)) is used to zoom in on the target even before the pilots have visual sight on the target. With the targeting pod, it is easy to recognize the target and check for possible armament. The F-16s are also equipped with flares. Usually, these are used as defense measure against heat-seeking missiles. However, they may also be used to attract the attention of the person(s) inside the cockpit of an intercepted aircraft.

During night-flying operations, the Belgian pilots also use Night Vision Goggles to amplify the remaining light in the sky.

The task of the Belgian Baltic Air Policing pilots is the same as at home, safeguarding the integrity of the airspace, safe for all users and all participants.

If aircraft do not follow international rules, like using a transponder or identifying to air control centers or filing a flightplan, the F-16s are scrambled to intercept and interrogate the aircraft that do not comply. As soon as the jets are airborne, a fighter control officer at the CRC guides the F-16s to the aircraft to be intercepted. When a 'rogue' aircraft has been intercepted a report is sent to the CRC and a photo is made for confirmation.

If the intercepted aircraft is posing a danger to other

aircraft or is heading to a forbidden zone, like in case of an emergency; the F-16 will divert this aircraft into another direction. In 99% of the intercepts, there is just an interrogation whereby the F-16s fly next to the aircraft and check the cockpit.

There are three kinds of scrambles

- ALPHA-SCRAMBLE: the "real thing" where the aircraft are launched in less than fifteen minutes
- TANGO-SCRAMBLE: a training scramble where the full scramble is exercised, without any aircraft to be intercepted
- SIERRA-SCRAMBLE: this is a training scramble where the full scramble is exercised, without a take-off.

Since September 2019, some 20 ALPHA-SCRAMBLE intercepts were done by the Belgian detachment, intercepting fighters, transport aircraft, and even a strategic bomber. During wintertime, the number of intercepts decreases, with an increase during springtime.

Most ALPHA-SCRAMBLES happen on the airway between the Russian area of St. Petersburg and Russian enclave Kaliningrad located between Lithuania and Poland; as the only way to travel to/from Kaliningrad is by sea or by air, without requesting visa and custom-clearances.

Besides that, some unidentified helicopters fly between Kaliningrad and some oilrigs at sea.

After this briefing, a TANGO-SCRAMBLE was planned for the media. When airborne, two F-16s should intercept the Belgian Airbus A321 that brought the media to Lithuania. However, due to the bad weather, only a SIERRA-SCRAMBLE was performed. Thus, some archive photos of a previous NATO Allied Air Command QRA mission (September 2018) have been added to show armed Belgian F-16s alongside the Airbus A321.

- Groundcrew checking the aircraft during engine startup (top)
- On each side the F-16 carries two air-to-air missiles: one wingtip-mounted AIM-120 AMRAAM and one AIM-9 Sidewinder under the wing (bottom)





Belgian Air Force QRA F-16AM with a camera mounted at the canopy-frame to take photos of the intercepted aircraft



U.S. AIR FORCE AT OSAN AB

REPORT AND IMAGES BY ALISTAIR ZAMMIT



History of the airbase and its host units

Following the Cold War, the Soviet Union and the United States divided Korea into two sovereign states. Both governments of the two new Korean states claimed to be the legitimate government of all of Korea, and neither accepted the border as permanent, consequently resulting in the Korean War in 1950.

During the war, there were 57 airbases, but three were not completed. Osan AB was the only base built entirely by U.S. Aviation Engineers intended

to conduct combat operations during the Korean War. Once the Armistice treaty was signed in 1953, the U.S. Air Force determined that Osan AB would serve as the hub of air operations on the Korean Peninsula given its location, the need to maintain a deterrent presence, and as an in-place installation should fighting erupt again. The base attained official permanent status in 1956.

Following the Armistice agreement, a number of incidents occurred such as the North Korean attack on USS Pueblo and seizure of its crew along with an U.S. Navy EC-131 being shot down in international

airspace which raised a period of tension with North Korea. Therefore, the presence of United States Pacific Air Forces (PACAF) at Osan AB is not to cause aggression but merely as a deterrence by the air power of the USAF to avoid such incidents from occurring again and to protect the people of South Korea.

The Republic of Korea Government has been one of the United States' strongest allies for over 70 years. Initially, the USAF came here to defend the people of South Korea from North Korea and over that time frame, they had developed a relationship where they

are one of their closest allies overall. The U.S. has a very good working relationship and they try to maintain that in all aspects of their relationship. The 7th AF is a numbered air force of the U.S. PACAF and is headquartered at Osan AFB. The command's mission is to plan and direct air component operations in the Republic of Korea and in the Northwest Pacific. The 7th AF has been an integral part of deterring aggression from North Korea. Its major units are the 51st FW and the 8th FW based at Kunsan Air Base. The host unit at Osan AB is the 51st Fighter Wing, undertaking their motto 'Leading the Charge'. Its

U.S. Air Force Lockheed U-2S *Dragon Lady* assigned to the 9th Reconnaissance Wing at Beale AFB, California



mission and role is to defend the base and the general public of Korea, execute contingency operations, and sustain the force. The 51st FW with its fighter squadrons and myriad of base support agencies conduct a full spectrum of missions that provide for the defense of the Republic of Korea. Every member of the Team Osan is vital in maintaining stability in Northeast Asia.

To accomplish their mission, the men and women of the 51st Fighter Wing work in one of four groups: the Operations Group, Mission Support Group, Maintenance Group, or Medical Group. Over 20

squadrons comprise the four groups which include two fighter squadrons: the 25th Fighter Squadron who fly the A-10, known as the "Assam Draggins", and the 36th Fighter Squadron, flying the F-16 known as the "Fiends".

Both 36th FS 'Flying Fiends' F-16s and the 25th FS 'Assam Dragons' A-10Cs sport a mustang on their tail, a visual representation of the Pegasus found on 51st FW's Emblem. Apart from the mustang, the tail fins carry distinctive chequered markings. These trace back to the 1950s and the WWII era, where back then, when one is flying with his squadron, one would

want those marks to know who his wingmen were. For the 51st FW, it was the chequered tail pattern. The fighter wing kept them to keep close ties to their lineage.

Along with the 51st FW at Osan are the 33rd Rescue Squadron with their HH-60Gs which form part of the 18th Wing. The 33rd RS is based at Kadena Air Base, Japan and they carry out search and rescue missions with both fixed wing aircraft and helicopters.

Last but not least, there is the 5th Reconnaissance Squadron nicknamed 'Black Cats' which form part of the 9th Reconnaissance Wing based at Beale Air Force

Base, California. The squadron operates the famous Lockheed U-2 aircraft conducting reconnaissance and surveillance missions.

Daily Flight Operations

We were able to witness a wave of A-10s departing for their morning missions, closely followed by a departure of F-16 fighting falcons, also flying their daily morning sorties. In between, we also witnessed some approaches by USAF F-16s from the Wolfpack

U.S. Air Force Lockheed U-2S *Dragon Lady* assigned to the 9th Reconnaissance Wing at Beale AFB, California



- U.S. Air Force F-16DM assigned to the 35th Fighter Squadron based at Kunsan AB, Korea (main image)
- U.S. Air Force F-16CM assigned to the 36th Fighter Squadron at Osan AB (inset)



squadron at Kunsan Air Base, another USAF base in Southern South Korea.

While witnessing flying operations, we also noted aircraft parked within maintenance hangars. A spokesperson from the maintenance department described how Osan is equipped with all the necessary equipment in order to be able to service all the aircraft types that operate from the base, in addition to other aircraft that regularly visit the base. They also mentioned that they have enough spare parts and engines in order to be able to be combat ready, should the need arise to protect Osan and the people

of South Korea from threats.

We were also lucky to witness two U-2S *Dragon Ladies* taxi past us prior to take off and perform their daily missions. This was a truly unbelievable experience, especially seeing the chase car interacting with the aircraft as it took off and collected the removable landing gear from the aircraft's wings. The presence of the U-2S at Osan also highlights the importance that Osan AB has for the USAF through the stationing of these majestic aircraft in such a strategic place within the Asian Region, close to Russia, North Korea and China.

While waiting for the A-10s to land back from their morning missions, another spokesperson described that military personnel and airmen interact quite well with South Korean civilians, who on their end have welcomed the USAF in their country with open arms. This was also evident in the number of merchandise shops and US themed restaurants in the area surrounding the base, showing the growing positive relations between these two countries.

This brought to an end a truly inspiring visit to one of the largest USAF bases in the Asian region. We

would like to thank all the military personnel who took great care of us and answered all questions that we had, providing details and data that portray the importance of Osan Air Base within the Asian- Pacific region.

U.S. Air Force Sikorsky HH-60G *Pave Hawk*
assigned to the 33rd Rescue Squadron



U.S. Air Force Fairchild-Republic A-10C *Thunderbolt II* assigned to the 25th Fighter Squadron



- U.S. Marine Corps Lockheed KC-130J *Hercules* assigned to VMGR-152 based at MCAS Iwakuni, Japan (main image)
- U.S. Army Beech C-12U *Huron* assigned to 52 AVN based at Wiesbaden, Germany (inset right)
- U.S. Air Force Lockheed HC-130J *Combat King II* assigned to the 79th Rescue Squadron at Davis-Monthan AFB (inset left)



JAPANESE SAMURAI PHANTOMS

REPORT AND IMAGES
BY JORIS VAN BOVEN
AND ALEX VAN NOYE



Over the years, the F-4EJ Kai has established a great reputation in Japan. Over the years, the *Phantom* fleet has been drastically updated to the Kai standard. The type is currently in the last days of its career within the Japan Air Self Defense Force and it is being replaced by the modern Lockheed-Martin F-35A Lightning II. The *Phantoms* have served with the Japanese Air Force for over 45 years and have flown in eight squadrons during their service.

Backbone of the Japanese Air Defense

The RF/F-4EJ Kai *Phantom* has formed the backbone of the Japanese Air Self Defense Force (JASDF) for many years. Japan selected the originally American F-4 *Phantom II* as the new primary fighter aircraft in the late 1960s. On November 1, 1968, this choice was made public and Japan became one of the few countries which were licensed to produce this aircraft in its national factories. The Nihon Koku Jietai (Japan Air Self Defense Force, JASDF) received a total of 154 F-4-EJs and RF-4Es. Almost the entire fleet of F-4EJ aircraft was built under license by Mitsubishi Heavy Industries. The RF-4E photo-reconnaissance aircraft were built in America by McDonnell Douglas. In Japanese service, the F-4 *Phantom II* mainly had to replace a large part of the outdated Lockheed F-104J

Starfighters. Because of its role during the Second World War, Japan had a restriction that prevented the JASDF aircraft from being equipped with air-to-ground missiles and bombs. As a result, the original F-4EJ *Phantoms* were delivered without the AN/AJB-7 bomb computer. The aircraft also had no possibility of refueling in the air, because this option was not built in. As a result, the Japanese *Phantoms* had a short operational range and therefore, could only be used for the defense of Japan. McDonnell Douglas built the first two prototypes of the F-4EJ. These aircraft flew for the first time on January 14, 1971. The following eleven aircraft were assembled by Mitsubishi in Japan. The first copy built in Japan flew on May 12, 1972. Mitsubishi continued to build all F-4EJs over the next nine years and production ended after 127 F-4EJ aircraft on May 20, 1981. This aircraft was the last F-4 ever to be built throughout the world. The F-4EJ entered service within the JASDF in August 1972 with a total of six operational squadrons. The units equipped with the F-4EJ Kai were 301, 302, 303, 304, 305

and 306 Hikotai. In addition to these operational units, several *Phantoms* were assigned to the test unit at Gifu to participate in testing and developing deployment of the type.

Upgrade to the Kai Standard

To upgrade the aging *Phantom* fleet, the JASDF has launched the F-4EJ Kai program. The word "Kai" means "renewed" in Japanese and is therefore similar to the MLU project applied to the European F-16s in the 90s. Initially, 110 aircraft were designated for the

This RF-4EJ Kai is one of 17 F-4EJs which were converted to the RF-4EJ standard. It is assigned to 501 Hikotai and carries an AN/ALQ-131 electronic counter measures (ECM) pod for selfprotection against radar-guided missiles.



RF-4EJ Kai (inset left and main image and F-4EJ modernized to RF-4EJ Kai standard (inset right) assigned to 501 Hikotai



update, but that number later was reduced to 96. The aircraft were upgraded with an APG-66 radar, making the *Phantom* capable of attacking ground targets. The F-4EJ Kai flew for the first time on July 17, 1984, and the first F-4EJ Kai was first delivered to the JASDF 306 Hikotai on November 24, 1989. The aircraft was equipped with the smaller and lighter AN/APG-66J pulse Doppler radar and a head-up display which resulted in a lookdown/shoot-down capability. The central computer, the J/APR-6 homing and warning system, the IFF system, and inertial navigation were updated. The Japanese Kai *Phantoms* can carry a large 610 American gallon F-15 fuel tank on the centerline. This fuel tank can withstand higher g-forces than the original F-4 centerline tank. The F-4EJ Kai can also carry the Westinghouse AN/ALQ-131 advanced multimode electronic countermeasures pod under the inner wing hard-points. This defense pod contains a wide range of modules and re-programmable software which makes it possible to quickly face new threats during a deployment. After the update, the F-4EJ Kai can also launch the AIM-7E/F Sparrow and the AIM-9L/P Sidewinder air-to-air missiles. This update makes the F-4EJ Kai a modern weapon that is much

better able to perform national defense tasks. The Japanese *Phantoms* were also able to carry the ASM-1 and ASM-2 anti-ship missiles under the wings from this moment on. This adjustment increased the capabilities of the F-4EJ Kai in the role of anti-ship warfare. The *Phantom* took over the anti-ship role from the Mitsubishi F-1 because that aircraft had a too short flight range. Also, there were not enough F-1s in service in Japan to carry out the task properly. The P-3 Orion's could also be equipped with Harpoon anti-ship missiles, but were not a worthy interpretation of the anti-ship role because these aircraft were too slow. In addition to these maritime weapons, the F-4EJ Kai is also suitable for carrying other air-ground weapons in the form of various bombs and rockets. This has made the *Phantom* a multi-purpose aircraft in Japan. The F-4EJ Kai was quickly delivered by Mitsubishi to the operational *Phantom* squadrons. Within a

F-4EJ assigned to Koku Kaihatsu Jikken Shudan
(Air Development and Test Command)



▲ F-4EJ Kai assigned to 301 Hikotai

▼ F-4EJ Kai assigned to Koku Kaihatsu Jikken Shudan





RF-4EJ Kai (above) and a F-4EJ modernized to RF-4EJ Kai standard carrying a photo-reconnaissance pod at the centerline station (below)



few years, it was decided to retire a large part of the *Phantom* fleet by replacing the aircraft with the Mitsubishi F-15J *Eagle*. The units at Komatsu were the first to make this switch to the more modern F-15J. In the mid-1990s, the F-1s began to age strongly due to the rapid technical progress of aviation. The three support units flying the F-1 had a lot of wear and tear on these aircraft. The Mitsubishi F-1 was already on the list to be replaced by the Mitsubishi F-2. However, this program was so delayed that it was decided to close the gap between the F-1 and the F-2 with the *Phantoms* from Komatsu which were released during the conversion to the F-15J. On March 17, 1997, the F-4EJ Kai aircraft were relocated to the 8 Hikotai at Misawa Air Base. In this role, the F-4EJ Kai was deployed for the first time as a ground attack aircraft. In total, the entire Japanese Kai fleet was reduced to just three operational squadrons. From 2001, 8 Hikotai has transitioned to the Mitsubishi F-2 at Tsuiki Air Base. The 302 Hikotai at Hyakuri AB started its conversion to the F-35A in 2019. The 301 Hikotai, also at Hyakuri AB, is the last unit in Japan which is still operational with the F-4EJ Kai.

Japanese Photo-reconnaissance Phantoms

One of the most special units of the Japanese Air Self Defense Force was the 501 Hikotai, based at the Japanese airbase Hyakuri. This unit was the only Japanese squadron that flew with the photo-reconnaissance variant of the F-4 *Phantom II*. The history of the 501 Hikotai began in Matsushima on March 27, 1962. The unit was established there as part of the Air Reconnaissance Group and initially had more than ten RF-86F *Sabres* in its inventory. At that time, the Sabre was the primary fighter aircraft of the Japan Air Self Defense Force (JASDF). The Japanese Sabres were, like many other Japanese combat aircraft, built under license by Mitsubishi Heavy Industries. In total, 501 Hikotai operated a total of eighteen RF-86F Sabres. The RF-86F was a modified version of the Japanese version of the *Sabre*. In the nose of the aircraft, the weapons were removed to make room for the cameras which would be used for reconnaissance tasks. A remarkable detail is that fake holes were painted on the fuselage nose section where the original version of the *Sabre* had the machine gun holes. In August 1962, the 501 Hikotai moved from Matsushima to Iruma. The unit also received several T-33As and a T-28B at this airbase. These aircraft were then used as base flight aircraft and for training and liaison. In October 1974, the unit moved from Iruma to Hyakuri, where they were equipped with the RF-4E *Phantom II* and the Tactical Reconnaissance Group was designated 501 Hikotai.



This RF-4E catches the arresting cable to rapidly stop the aircraft on the runway

After the move to Hyakuri in 1974, a detachment remained on Iruma with the RF-86F *Sabre*. This lasted until 1977 when the Sabres were phased out and a part was handed over to the Koku Sotai Shireibu Hikotai (HQ Squadron). The 501 Hikotai received fourteen RF-4E *Phantom II* photo-reconnaissance aircraft at Hyakuri. Remarkable about this aircraft is that it is unarmed and can only be used for reconnaissance tasks. It carries three types of cameras in the nose: a vertical camera, a camera for low altitudes and a camera for high altitudes. The photo-reconnaissance aircraft of the JASDF are easily recognizable by the beautiful color schemes and the well-known "woodpecker" on the tail. The emblem of the 501 Hikotai is derived from the

American cartoon character Woody Woodpecker. The woodpecker replaced the old emblem from the time of the RF-86F in which the woodpecker was wearing a bow tie and holding a telescope. Woody Woodpecker, however, still has his bow tie on the tail of the RF-4Es. To provide the 501 Hikotai with more aircraft for photo reconnaissance tasks, a total of fifteen F-4EJ *Phantoms* were converted to a photo-reconnaissance version. Seventeen F-4EJ aircraft were converted to the RF-4EJ *Phantom II* standard. In contrast to the standard RF-4E, this additional photo-reconnaissance *Phantoms* did not receive a modified nose section. The cameras of these aircraft were carried in special camera pods that were placed under the centerline of the aircraft. These pods initially contained the same

systems as the original version of the RF-4E.

Just like the standard version of the *Phantom* the F-4EJ, the photo-reconnaissance aircraft were also updated to a higher standard to make the aircraft suitable for future use. The standard versions of the *Phantom* were modernized from 1984 and only after more than eight years, the first RF-4 *Phantoms* were up for an update. Of the original RF-4E *Phantom II* aircraft, thirteen of the fourteen were modernized to the RF-4E Kai standard, one aircraft was lost in the years before the update. For the largest part, photo-reconnaissance versions received the same upgrades as the standard version of the F-4EJ *Phantom*. The original RF-4E *Phantom IIs* were modernized to

the RF-4E Kai standard. The thirteen aircraft were equipped with an AN/APQ-172 TFR radar and the J/APR-2 RWR was replaced by the J/APR-5. Both systems were made in Japan. A part of the seventeen RF-4EJ photo-reconnaissance aircraft was also converted to RF-4EJ Kai Standard. A total of eight aircraft were updated to this standard. The other aircraft were phased out shortly after the update phase. Although no internal cameras were mounted in the RF-4EJ, the aircraft were modernized according to the Kai standard. The reconnaissance equipment of this version of the *Phantom* was mainly placed in the pods under the aircraft. The installed systems were equipped with the TACER (electronic reconnaissance pod with data link), the TAC pod with KS-135A and

KS-95B cameras, the D-500UR IR detection system and the LOROP pod with a KS-146B camera.

The unarmed RF-4Es could perform air measurements and photography in all weather conditions. The aircraft could also operate at night with the help of the different cameras which are built into the nose of the aircraft or mounted with a pod under the fuselage. The 501 Hikotai reconnaissance squadron mostly flew defense missions around Japan. The unit also conducted damage assessments after natural disasters, which occur frequently in Japan. The RF-4Es were used in the past to investigate the Fukushima Daiichi nuclear power plant following the March 2011 earthquake and tsunami in northeastern Japan. The aircraft also often helped to identify houses affected by landslides following the Hokkaido earthquake in September 2019. The RF-4E and RF-4EJ were well known for their exotic color schemes. The aircraft were painted in three different schemes. A green and brown scheme which was mostly applied to the RF-4EJ Kai. The RF-4E Kai traditionally had a green with beige color scheme. Some RF-4E *Phantoms* were painted in a blue color scheme that was applied on

the occasion of the 50th anniversary of the JASDF. All *Phantoms* showed a shark mouth painted on the nose of the aircraft. Some of the *Phantoms* had the well-known spook painted on the splitter plate of the intake.

Phantom Pharewell in Japan

The world-famous McDonnell Douglas F-4 *Phantom II* is currently still in operation within the JASDF. However, this will change soon. This year, the Phantom will be phased out all over Japan, being replaced by the modern fifth-generation Lockheed-Martin F-35A *Lightning II*. After almost 50 years of service with the Japanese Air Force, the Phantom is outdated and due for replacement. After a long study for a suitable successor to the F-4 *Phantom II*, Japan decided to acquire the Lockheed-Martin F-35A *Lightning II* in December 2011. Japan had initially chosen the Lockheed-Martin F-22A *Raptor*, but this application was eventually rejected because the aircraft would be far too expensive for the Japanese defense budget. The F-35A *Lightning II* is going to be Japan's first



RF-4EJ Kai assigned to 301 Hikotai



F-4EJ Kai assigned to 301 Hikotai



fifth-generation fighter plane and will, therefore, play the most important role in the JASDF. The very first Japanese F-35A landed at Luke Air Force Base in the United States on November 29, 2016. Since then, the JASDF has started training its first fighter pilots on this new fifth-generation fighter aircraft. At the U.S. Airbase Luke AFB, Japan is part of an international training unit that trains pilots on the F-35A Lightning II. At the beginning of 2019, the first F-35s would be relocated to Japan to form the first operational unit. Of the originally seven squadrons and a test unit, only one squadron and a test unit are now active with the F-4 *Phantom*. The other squadrons have since moved to the Mitsubishi F-15J *Eagle*.

In August 2017, it was announced that the 302 Hikotai would be the first unit in the JASDF to transition to the F-35 *Lightning II*. Until March 2019, the squadron has flown the *Phantom* for many years from Nyatubaru AB and later from Hyakuri AB. They moved from Hyakuri AB to Misawa AB in northern Japan that same month. The JASDF already started building the first F-35 squadron at Misawa AB in January 2018. Since the first *Lightnings* were moved to Misawa AB, thirteen aircraft have already been delivered to the squadron on Misawa AB within 15 months. On March 29, 2019, the 302 Hikotai was the first F-35 squadron to declare initial operational capability (IOC). In 2020, the unit will be supplied

- F-4EJ Kai assigned to 301 Hikotai (above left)
- F-4EJ modernized to RF-4EJ Kai standard assigned to 501 Hikotai (above right)
- RF-4EJ Kai assigned to 501 Hikotai (below left and right)



with more aircraft until the squadron is completely at full strength. On April 9, 2019, the JASDF lost its first F-35A, when one of the 302 Hikotai's F-35As went missing over the Pacific Ocean. It turned out that the aircraft crashed due to pilot error.

Since the introduction of the RF-4 at the JASDF in 1974, the Air Force has had an excellent aircraft for the very important photo-reconnaissance tasks. On March 9, 2020, the JASDF ended flying the RF-4E *Phantom II* photo-reconnaissance version after 46 years. The Japanese Ministry of Defense plans to replace the old fleet of RF-4Es of the Tactical Reconnaissance Group with the hyper-modern F-35A and F-35B *Lightning II*. Japan is already flying the F-35A and will also purchase the F-35B in the future. With the phasing out of the RF-4E *Phantom II*, Japan lost its only photo-reconnaissance squadron in 2020. This task will be taken over by the F-15J *Eagle*. From 2007, Japan has an unknown number of F-15Js converted for the photo-reconnaissance. These Eagles can be equipped with Lockheed Martin Phoenix Eye SAR pod. With this pod, modern frontline combat aircraft can be converted into a photo-reconnaissance platform with minimal effort. The future for the 501 Hikotai is still unknown. Whether the unit will be converted to a squadron operating the F-35 has not yet been decided by the Japanese government.

Today, the 301 Hikotai is the only unit that still flies with the F-4EJ Kai. This unit will also start the transition to the F-35 very quickly year. Like the 302 Hikotai, the 301 Hikotai will be moving from Hyakuri AB to Misawa AB in northern Japan. It is not yet certain what will happen to Hyakuri AB. There are plans to base a squadron with the Mitsubishi F-2 at this airbase. What is certain is that 2020 will be the last year in which the *Phantom* will fly in the country of the rising sun. The delivery of new F-35A *Lightning II* aircraft will continue as usual. They are manufactured under license in Japan by Mitsubishi Heavy Industries. Japan plans to purchase a total of 157 F-35s. This batch consists of 115 F-35A *Lightning IIs* for conventional deployment and 42 F-35Bs for deployment at sea.



F-35A assigned to 302 Hikotai

EXERCISE BACCARAT 2019

REPORT AND IMAGES
BY MARTIJN VENIX



For the third year in a row, the French 4ème Brigade d'Aérocombat (4th Aerocombat Brigade) has organized a large scale exercise in the north-eastern part of the country.

The exercise BACCARAT brought together 2,200+ soldiers from three different countries: France, Spain and Great Britain. Australia sent a group of observers. Planned a full year in advance and lasting from 16 to 26 September 2019, the exercise progressed

eastwards from the army exercise fields around the city of Reims to the Rhine River on the German border. The scenario allowed a large scale exercise carried out and based on multi-national cooperation and combined training.

In the exercise scenario, a hostile and mobile military force (emanating from a secessionist region) has settled down in the Champagne-Ardenne region. France and her allies Britain and Spain were massing their troops and equipment east of Reims to regain

control in this region where the sovereignty of the country is undermined. Similarly to Islamist parties in the south Sahara region, the enemy (made up of conventional forces and mobile militia) moves their groups of foot soldiers fast thanks to all-terrain vehicles.

The appropriate reaction is based on the use of French units: the 13th Foreign Legion's half brigade, the 11th Paratroop brigade, commandos of the 27th Mountain

Infantry Brigade, electronic intelligence units, artillery, engineers and dog unit specialists and the usual support units – transport, health, and refueling. The air component included helicopters of France's 1st, 3rd, and 5th Combat Helicopter Regiments. The Spanish component included three Tigre helicopters of the 1st Attack Helicopter Battalion, three NH-90 Caiman transport helicopters from the 3rd Battalion of Maneuver Helicopters from Logrono and two CH-47D Chinook of the 5th Battalion of Transport Helicopter

Two Boeing CH-47D *Chinook* transport helicopters of the Spanish Army



from Colmenar. The United Kingdom brought two RAF CH-47 Chinooks Mark IV from the RAF Odiham based squadrons with four Army Aviation Apaches and one Wildcat from the 3rd Regiment at Middle Wallop. All in all, the defending force gathered 1,500 soldiers involved at any time, 60 helicopters and 80 armored vehicles. The commanding officer of the French 4th BAC, General Gout was in charge of overall operations with the assistance of a Spanish officer leading the international helicopter battalion.

The Central Europe scenario was complemented by actions taken to counter mobile hostile groups, exactly like what currently takes place in the Sahara-Sahel region. The defending forces had regular updates of the hostile forces' situation thanks to the multi-sensor intelligence group's work as well as traditional human intelligence missions. These were carried out by helicopter crews and recce

teams of France's 2nd Hussard Regiment and their quads transported by British and Spanish Chinooks. Apache and Tigre attack helicopters cleared the way for the French Pumas, Caimans and one Cougar and Spanish Caimans to move infantry units fast. All those components made it possible for the friendly ground forces to block and then push the hostile forces back towards the northeast corner of France.

The whole exercise relied on the 4th BAC's ability to act over large distances, to maintain a high level of communication with its units and the allied cooperating forces, and to anticipate any urgent need of heliborne support in favor of the ground forces.

NH Industries/Airbus Helicopters NH90 TTH Tactical Transport Helicopter of the French Army (left) and Spanish Army (below)





▲ Spanish Army Boeing CH-47D *Chinook*
▼ Spanish Army Eurocopter Tigre HAF



French Army Aerospatiale AS555UN *Fennec* and Eurocopter Tiger ▲
French Army Aerospatiale SA330B *Puma* and Spanish Army NH90-TTH ▼





Royal Army Boeing Apache AH1
with a French Army Tigre HAF



French Army Aerospatiale SA330B
Puma ▲ and AS532UM Cougar ▼



French Army Aerospatiale SA342M
Gazelle (▲) and AS555UN Fennec (▼)





Spanish Army Eurocopter Tigre HAF



French Army Eurocopter Tigre HAF



AgustaWestland
Wildcat AH1 of
the Royal Army



Boeing CH-47D
Chinook of the
Spanish Army

TURKU AIRSHOW 2019

REPORT AND IMAGES
BY MIKA VIROLAINEN



Every summer, the Finnish Aeronautical Association arranges an air show somewhere in Finland with the help of a local Aviation Club. This event usually takes place in mid-June, however, sometimes as early as May. In the 2010s, Turku was the host-aerodrome three times: 2011, 2015 and 2019. Its apron has enough space and the weather is most likely to be clearer in south-western Finland. Photographers appreciate the alignment of the RWY (08/26) and the fact that the show area is on the south side so that the sun is behind the crowd for most of the show.

Default air show participants in Finland include the Air Force with their F/A-18C *Hornets*, BAe Hawks, and the aerobatic team Midnight Hawks. The Finnish Army normally shows up with at least the NH-90. The Coast Guard Do-228, *Super Puma* and *Koala* are also almost certain visitors. The Finnish Air Force has been flying the *Hornet* for 25 years. This shows in their solo flying display with vertical maneuvers, tight turns, condensation on top of the LERXs and wings

sometimes even in dry air, and deploying flares. The solo has won prizes in the Royal International Air Tattoo more than once, and it is internationally well-recognized.

The *Hornets* in Finnish Air Force service are coming of age, and so a replacement competition is underway. The participants, namely Eurofighter *Typhoon*, Dassault Rafale, SAAB *Gripen E*, F-35, and *Super*

Hornet have been eager to present their aircraft not only to the decision-makers but also to the general public, and so we have been treated with some great shows in the previous years. This time, Dassault sent a pair of Rafales to Turku, and a pair of *Typhoons* took part, too. The i has become another common guest at Finnish air shows. The F-35 participated in the static display only, showing up in Finland for

the first time. The Super Hornet participated in two previous years but were not present this time.

The Finnish Army NH-90s presented their size and power with lots of tight turns in low altitude. In 2017, they added a salvo of flares into their show routine, which naturally offers some nice photo-opportunities. In 2017, the Midnight Hawks were painted with the colors of the Finnish flag to celebrate Finland's 100 years of independence. That year, the main show in Finland was arranged by the Finnish Aviation Museum in the center of Helsinki. Over the last years, the Midnight Hawks have also participated in some shows in Europe, like the RIAT in 2017.

Another first this year was the Polish Air Force Orlik Team, flying the Polish PZL Orlik Turboprop trainer. The team was tightly packed and because of the relatively low speed, it stayed close for most of the show.

Historic aircraft are also a common sight in Finnish air shows. The Gloster Gauntlet has a permanent slot in

Legacy-formation of a Hispano HA-1112-M4L *Buchon* (spanish license-built Messerschmitt Bf 109G), a De Havilland DH.115 *Vampire* Mk.55 and a Finnish Air Force F/A-18C *Hornet*.



the show, as does the Finnish 1930s trainer VL Viima. A Yak-11 presented its agility and sound. There are two flying Fouga Magisters in Finland, which one can see flying either as a solo or a team almost certainly every year. During the 2010s, some previously important aircraft have visited the shows, like the MiG-15, MiG-21, and *Vampire*. This time, the MiG-15, unfortunately, had to cancel, but the *Vampire* showed up from Norway, and the former Finnish Air Force front line fighter Me-109 showed up in its Buffon-version. The crowd was treated with a very rare fly-by

when three Finnish Air Force front-line fighters were presented in formation: the Me-109, the deHavilland Vampire, and the F/A-18C *Hornet*. In 2020, the show will be held at Kauhava aerodrome in the middle parts of Finland on 13-14 June. Kauhava has a long tradition with military aviation as the Finnish Air Force used to train all their fighter pilots there for close to 90 years. That is until they pulled out of Kauhava at the end of 2014 and moved all their training to Jyväskylä. Now, Kauhava aerodrome is maintained by a local aero club.

Polish Air Force Orlik Team, flying the Polish PZL Orlik turboprop trainer



▲▼ Polish Air Force Orlik Team with PZL Orlik turboprop trainer



Finnish Air Force Midnight Hawks with Hawk Mk.51 jet trainer ▲▼





Finnish Army NH90 TTH



Finnish Air Force F/A-18C



Royal Air Force Typhoon FGR4



French Air Force Rafale C



Swedish Air Force JAS39C Gripen



▲ Finnish Border Guard Dornier Do 228
▼ Hispano HA-1112-M4L *Buchon*



Finnish Border Guard AS332 *Super Puma* ▲
Valition Viima II ▼



NIGHT THUNDERS ON THE PROWL

REPORT AND PHOTOGRAPHY BY DRAGAN CVETIC



North Macedonia is the nest of one of the most combat-capable Soviet-era Mi-24V Hind-E helicopters flying today. The photos were taken in October 2019 during night-time training flights at the Petrovec airbase. Supplementing these shots is a brief overview of the Mi-24's eighteen years' long history of service with this small Balkan nation.

The Mi-24 is an iconic Russian designed and built attack helicopter. While in Europe less and less helicopters of this type are operational with the former Warsaw Pact member states, one of the last remaining countries which use the Mi-24 is North

Macedonia in its Army Air Brigade, commonly known as the Macedonian Air Force.

The Mi-24 has quite a history with the small Balkan nation. The first pair of second-hand Mi-24V (NATO: Hind-E) helicopters were acquired on March 23, 2001, and were delivered directly from Ukraine's KFOR (Kosovo Force) mission active in the neighboring south Serbian province of Kosovo. They were flown directly to the Petrovec airbase near Skopje. They instantly entered operational service and combat operations with mixed crews consisting of both Ukrainian instructor-pilots and Macedonian flight personnel.

The unit operating the Mi-24s was the 201. Protiv Oklopna Helikopterska Eskadrila (201. POHE, 201st Anti-armor Helicopter Squadron), and the aircraft received the tactical serials 201 and 202. During the war that followed, additional six Mi-24Vs (serials 203-208) were acquired by mid-June 2001, while until the end of the hostilities another two Mi-24V (209 and 210) and a pair of Mi-24K (211 and 212) Hind-G2 helicopters entered service with the Macedonian Air Force.

Once the war came to its end in mid-August 2001, the Army commenced its reorganization process, and it was decided that the Mi-24V fleet should go through

an extensive modernization process. One of the main reasons for the modernization of these helicopters was the Hinds' lack of ability for efficient, safe and lethal use at night. Israel's renowned Elbit Systems was awarded the contract to upgrade the helicopters and Mi-24Vs 209 and 210 were chosen to be the first Macedonian Hinds to pass the modernization.

The process began in early 2004 under the project codename "Jasmin" (Yasmin). The Israeli experts deployed to Petrovec and began modifying the selected Mi-24s in order to turn them into an NVG (Night Vision Goggles) compatible and capable platform. They were also equipped with Aviator's



Night Vision Heads-Up Display (ANVIS/HUD) system developed by Elbit Systems.

By late 2005, a pair of non-modernized Mi-24Vs (201 and 205) returned from a general overhaul in Ukraine's state enterprise AVIAKON Konotop Aircraft Repair Plant. These helicopters were painted with a new splinter-type camouflage specially developed by the Air Force to be used on domestic terrain. Been prototypes for the second stage of the modernization with the codename "Alexander", these two helicopters received in addition to the "Jasmin" equipment a port-side mounted ElOp-produced third-generation compact multi-purpose advanced stabilized system (COMPASS) equipped with thermal imaging, color TV camera with continuous zoom, IR rangefinder,

and advanced automatic tracker. They also received the HELICOM advanced digital integrated command, control and mission management system designed to provide the helicopter pilots and crew with real-time tactical pictures and digital moving map for enhanced situational awareness. As part of the HELICOM system, each cockpit has two 6in x 8in (15cm x 20 cm) color displays, one of which is a multi-functional touch display (MFTD) while the other is a regular multi-functional display (MFD).

The installation of new and heavy equipment meant that the Mi-24s had to have their weight reduced - the 9K113 Shturm (AT-6 Spiral) anti-tank guided missile system and the rarely-used system for automatic bombardment were removed alongside

all of the related installations. This left the second-stage modernized Macedonian Mi-24Vs without the possibility to fire guided anti-tank missiles, a shortcoming that was supposed to be overcome by the addition of Elbit's STAR (Smart Tactical Advanced Rocket) precise-strike system. Sadly, due to financial constraints, this weapons pallet upgrade was never put in motion.

Meanwhile, by the end of 2007, an additional two Mi-24V helicopters (202 and 207) passed the general overhaul at AVIAKON. Being painted in the now standardized splinter camouflage, these aircraft have black painted cockpits and green cockpit lights in addition to their TV3-117VM engines being modified to the TV3-117VMA standard suitable for high-altitude

operations.

With the completion of the second stage of the modernization process, the Macedonian Air Force experienced a real boost in operational capabilities and flight safety and was indeed transformed into a high-tech precision attack force capable of all-weather day and night combat deployments and operations. In the 10 years to follow, the Macedonian Air Force used its Hinds with great results attending foreign and domestic exercises while at the same time protecting the territorial integrity and peace of the Republic of North Macedonia.

Being currently operationally organized with the renamed Skvadron na borbeni helikopteri "Nokjni Molnji" (sbh, Combat Helicopter Squadron "Night



Thunders"), North Macedonia's Mi-24 fleet relies on two operational Jasmin-modernized helicopters (209 and 210) with hope for additional four to pass the general overhaul soon, following the recent and ongoing examples of NATO-member nations Bulgaria, Hungary, Czech Republic, and Poland that all opted to restore and even modernize their old but quite capable Mi-24 attack helicopters. However, the fate of North Macedonia's Mi-24s remains uncertain if reading the nation's 2018 Strategic Defense Review (SDR) that calls for keeping two

operational Mi-24Vs until around 2025 while at the same time investing in the Mi-8/17 Hip-H helicopter fleet that is expected to be the core of the future Air Brigade, and for the purpose to be eventually expanded through the acceptance of three Mi-17/171 helicopters now in service with Police's Helikopterska Edinica za Specijalni Nameni (Helicopter Unit for Special Purposes).



Additional images by Igor Bozinovski
of North Macedonia's two operational
Jasmin-modernized Mi-24V *Hind-E*'s





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