# THE AVIATION MAGAZINE

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№ 79 July-August 2022
Volume 13, Issue 4

- Szolnok Helicopter Bázis
- Cold Response 2022
- Shield 22
- Vulcan Photo Session
- And so much more ...

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**Cover:** Armée de Terre NH90-TTH assigned to 1RHC during exercise BACCARAT 2021. ***Photo Fly High Aeromedia***
**This page:** Photo session with Vulcan B Mk.2 at Southend Airport, Essex in May 2022. ***Photo Kris Christiaens***

# 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.

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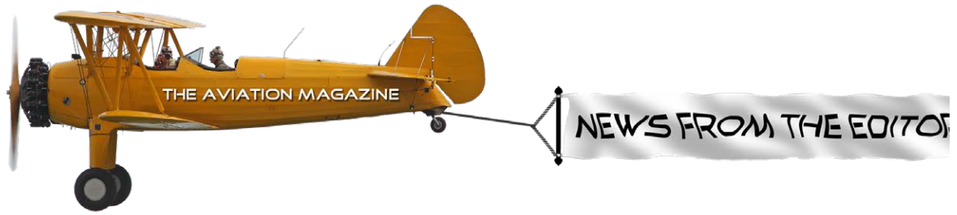


Dear Readers,

The daily news is still dominated by the war between Ukraine and Russia and the tensions between NATO and Russia. NATO is increasing its presence, including air policing, in former Warsaw Pact communist countries such as northern Macedonia, Bulgaria and Serbia. International exercises like 'Cold Response' and 'Swift Response' demonstrate the defense readiness and cohesion of NATO allies. This and other interesting topics, such as the photo shoot of a Cold War-era Vulcan, are covered in this issue.

Now, we are pleased to present you another exciting issue of THE AVIATION MAGAZINE, which you can download **here**.

For now, the whole team of THE AVIATION MAGAZINE wishes you all the best and stay healty!

Ralf Peter WALTER
Publisher & Editor

Thank you very much for reading and downloading THE AVIATION MAGAZINE, the BEST and FREE e-based magazine on military aviation since 2009. Imitated by so many, but never surpassed!

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# SZOLNOK HELICOPTER BÁZIS

**ARTICLE** BY BRAM MARIJNISSEN,
PETER DE VOS AND RENÉ SLEEGERS


## HISTORY

Szolnok, also known as Szolnok-Rákóczifalva, was the more important of the two airfields during World War II compared to the Szolnok-Szandai airfield, which is closer to the city and was only used by the German Air Force as an alternative airfield during the Balkan campaign. Szolnok-Rákóczifalva was an operational base for Hungarian fighter aircraft during the war. The 1st Group of the 1st Fighter Regiment was located there from 1940 to around May 1944 and, for a shorter period, the 1st Independent Hunting Group "Horthy István" was added in the spring of 1942. In 1944, the German Air Force only used the airfield as a base for flying reserve units. From February to August 1944, this included the V group of Kampfgeschwader 53 (V./KG 53) and in August of that year, the IV. Group of Kampfgeschwader 55 (IV./KG 55). The He 111 stationed there were the target of an American B-24 bomber attack by the Fifteenth Air Force on 20 August 1944. The Russian Army captured the base and Szolnok became a Russian medical base for injured soldiers in 1944.

Until 1973, there was no Hungarian Army Aviation Command. The Hungarian tactical reconnaissance, cargo, and currier air units were subordinate to the Air Defense Command in peacetime. From 1964 to 1965, the pilot school at Szolnok airfield received 18 new L-29 *Delfin* trainer aircraft. The school's other two squadrons used the MiG-15bis 'Fagot-B' for advanced training. In the early seventies, the 101st Reconnaissance Air Regiment was formed at Szolnok. All aircraft of the pilot school remained in the squadrons but the task of the squadrons changed. In the late seventies, the MiGs left Szolnok and only the L-29 *Delfins* stayed at the base. In 1984, the old L-29 *Delfin* reconnaissance aircraft were scrapped.

When the Soviet Union fell apart in 1991, Hungary declared itself independent. In the early 90s, the 89. Vegyes Szállító Repülő Ezred, a mixed transport regiment with one squadron equipped with the An-26 *Curl* transport aircraft and two squadrons with Mi-8S and Mi-8T helicopters was based at Szolnok airfield. At Szentkiralyszabadja airfield, the 87. 'Bakony' Herchihelikopter Ezred was based with two squadrons Mi-24D and Mi-24Vs, one squadron with Mi-8T helicopters, and one squadron with Mi-17 transport and a small number of special mission equipped Mi-17PP helicopters. At Börgönd airfield, the 'Asboth Oszkár' helicopter regiment with the Mi-2 helicopters was based.

During the 90s, a lot changed within the Hungarian Air Force and Börgönd airfield was the first base that closed. The Mi-2s transferred to Szolnok. Followed by Szentkiralyszabadja a few years later all the Mi-8s, Mi-17s, and Mi-24s also transferred to Szolnok airbase. The An-26 *Curl* transport aircraft from Szolnok AB transferred to Kecskemét AB. From that moment, the unit was renamed MH 86. Szolnok Helicopter Ezred. During the years, the Mi-2s and most Mi-8s, Mi-17s, and Mi-24s were withdrawn from use. An Air Academy was established within the Hungarian Air Force for which twelve Yak-52s were bought from Romania and based at Szolnok AB but on paper, they were based at Kecskemet Air Base. Those Yaks were replaced by Zlin training aircraft not too long ago. Next to the Yaks, twenty L-39ZOs were bought from former East Germany and also based at Kecskemét

A Mi-24P *Hind* and two H145M helicopters are ready for take-off from the FARP (Forward Air Refueling Point) at the Bakony range.


102
VIGYÁZZ!


102
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VIGYÁZZ!


101
VIGYÁZZ!


AB. In 2018, Szolnok AB was completely renewed due to the delivery of new helicopters and more training aircraft.

**PRESENT**

Today, Solnok AB is home to MH 86. 'Szolnok' Helicopter Ezred with two flying battalions and one squadron. The first one is 1. Szállitó Helikopter Zászlóalj which are flying with the Mi-17s and H145s. The other one is Phoenix Attack Helicopter Battalion and they are flying with the Mi-24P/Vs. A third squadron is also operating at Szolnok AB as a "trainer" squadron, flying the AS350s helicopter, the four-seat Zlin 143s and the two-seat Zlin 242s aircraft.

Currently, only a handful of Mi-17s are operational for Search and Rescue (SAR) duties. As new helicopters are being acquired, within a few years, these aging Russian-made helicopters will be withdrawn from service like the Mi-8s have been in 2021. The other Russian-made helicopters, the Mi-24P and V, are still operational after they received extensive maintenance in Russia in 2017 and 2019. Six Mi-24s, former (East) German Air Force helicopters, which have been stored for many years at Szentkiralyszabadja AB are still operational as Mi-24Ps. Next to those six attack helicopters, another two Mi-24Vs are still operational. All eight Mi-24s were completely overhauled and upgraded in Russia.

On 18 November 2019, a new era began with the delivery of the first two Airbus Helicopters H145Ms to MH 86. Helicopter Base. A total of twenty H145Ms were ordered and the last two were delivered at the end of 2021. With the "HForce" Modular Weapon System, the H145Ms can be configured as attack helicopter. This system allows the helicopter to be armed with 70 mm rockets, a 12.7mm machine gun, or a 20mm gun. A total of five H145Ms can be equipped with the above at the same time, and all the equipment fits on all twenty helicopters. Besides armament, the helicopters also received a missile protection package, a fast roping system, an electronic countermeasures system, and an electro-optical targeting camera. The H145Ms are used for HForce, Transport, and VIP tasks.

**TRAINING**

The basic military training takes place in Budapest and lasts two years. After passing the basic military training, basic flying training begins at Szolnok AB. The first part of the training is on the Zlin single-engine propeller aircraft. The next step is flying the Eurocopter AS350 *Ecureuil*, followed by the Airbus Helicopters H145. In this final part of the flight training, the decision is made as to which helicopter the student is best qualified for. During basic flying training, which also lasts two years, the student pilot accumulates about 200 flight hours with these three types. In total, it takes about four years from the beginning of the basic military training for the student pilot to earn her/his wings to fly helicopters.

**Left** Four-seat Zlin 143LSi *Genius* trainer aircraft.
**Right:** The instructor pilot and his female student are performing the pre-flight check of their Zlin 242L prior to another training flight

# ZLIN 242L


1


2


3


4

## MAINTENANCE

At Szolnok AB, for the H145M operational and intermediate-level maintenance is performed, and continuing airworthiness management organization services (CAMO) are included. Also, scheduled, periodical inspection/maintenance at 1,000 flying hours of the Mi-24 and 2,000 flying hours of the Mi-17 is done there too.

Heavy maintenance for the helicopters is done at different places: The Airbus Helicopters H145M go to the Airbus Helicopters factory at Donauwörth, Germany, the Mi-24s – they had their heavy maintenance in Russia between 2017 and 2019 – and Mi-17s will go to Russia. The only problem with the Russian-made helicopters is getting spare parts from Russia. That is why the Mi-8s aren't flying anymore because they need spare parts. LOM Praha in Czechia can also deliver spare parts but then, the warranties from Russia will expire.

## SEARCH AND RESCUE (SAR) DUTY

The Hungarian Air Force is using the Mi-17s for SAR tasks and there is one Mi-17 at Szolnok AB and one Mi-17 at Papá AB 7/24 stand-by. On a SAR mission, the crew of a Mi-17 is seven people: pilot, co-pilot, mechanic, flight engineer, medic, and two paratroopers, depending on the mission.

## FUTURE

At the end of 2016, the Hungarian Government launched the ambitious "Zrinyi 2026" modernization program and since then, much has changed within the Hungarian Air Force. Six Mi-24Ps and two Mi-24Vs were overhauled in Russia. Twenty H145Ms, two Zlin Z 143s, and six Zlin 242Ls were delivered in the past few years. Also, sixteen Airbus Helicopters H225Ms with the HForce modular weapon system have been ordered. The first H225M should be delivered in 2023 to MH 86. Szolnok AB. The tasks of the H225Ms are special operations, transport, and search and rescue (SAR). With the delivery of all these helicopters, the end is near for the Mi-17s and Mi-24s. There is also the need for extra hangar space or modernization of the existing hangars. For advanced training, the Hungarian Government is considering the L-39NG or the Embraer EMB314 *Super Tucano*, but it is unknown whether they will be based at SzolnokAB or Kecskemét AB.

**There are various configurations of the HM145**

**1, 3** The helicopter in a clean configuration is used for standard transport tasks.

**2** The attack configuration comprises an electro optical/infrared sensor and an 12 x 68/70 mm unguided rocket launcher.

**3** With an installed hoist and stretchers the H145M can perform search and rescue missions.

### EXERCISE BREAK THROUGH 2021

Exercise BREAK THROUGH 2021 took place at the Bakony range just north of the former Hungarian airbase Szentkiralyszabadja. This range is 200 square kilometers in size. It is also used by the JAS39 *Gripens* for live bombing. Four Mi-24s, eight H145Ms, and one Mi-17 took part in this exercise. In addition, one Mi-17 was on standby for SAR. A FARP (Forward Air Refueling Point) has been established at the Bakony range, which served to refuel the helicopters and as a launching point for missions in the training area. After the mission, the helicopters landed back at the FARP for debriefing. Overnight, the helicopters were parked at Papá Air Force Base. This exercise was a realistic training and firing exercise to improve cooperation with Hungarian land forces. It was also the first time the H145M took part in such an exercise, so the Hungarian air force could get to know the H145M better.

These two H145M are in transport configuration and not armed.

An Mi-17 landing at the FARP after having it s mission completed.


705
DANGER


702
DANGER


702

This Mi-17 has three pylons mounted to be used e.g. for rocket pods on a tubular support structure on either side of the fuselage. The port side pylons have a guard to prevent parachutes snagging them during paratrooper operations.


Mi-17Ns and a Mi-24P coming in to land. The Mi-24 is ex-GDR.

Two Mi-24P *Hinds* just took off for a training mission. The helicopters are carrying a B-8V20 rocket pod on either side. This rocket pod can hold 20 rounds of unguided 80mm S-8 rockets.

# PAKISTAN RESOLUTION DAY

**REPORT** BY SYED ZOHAIB ZAIDI


Four Chengdu J-7PGs assigned to 17 (AS) Squadron.

Pakistan Resolution Day is a national day in Pakistan primarily commemorating the adoption of the first Constitution of Pakistan during the transition of the Dominion of Pakistan to the Islamic Republic of Pakistan on 23 March 1956 making Pakistan the world's first Islamic Republic. The day also celebrates the adoption of the Lahore Resolution by the Muslim League at the Minar-e-Pakistan (lit. Pakistan Tower) which is called for the creation of an independent sovereign state from the provinces with Muslim majorities located in the North-West and East of British India (excluding autonomous princely States) on 23 March 1940. The day is celebrated annually throughout the country as a public holiday. The Pakistan Armed Forces usually hold a military parade to celebrate both the passing of the Lahore Resolution and the Constitution of 1956. The Pakistan Air Force did a fly-past along with an impressive show of force. Formations of each type of aircraft do a fl-ypast while JF-17 and F-16 perform Solo Aerobatics

KE-03 assigned to 4 (EW) Squadron **(left)** and Saab 2000AEW assigned to 3 (EW) Squadron **(right)**.


Chengdu J-10CE assigned to 15(MR) Squadron. The J-10 is an indigenously built multirole fighter aircraft, mainly designed for air-to-air combat, but also capable to perform strike missions.



JF-17 Thunder assigned to 26(MR) Squadron **(top)** and 2(MR) Squadron **(above).** JF-17 Thunder is an advanced, light-weight, all weather, day / night multi-role fighter aircraft; developed as a joint venture between Pakistan Aeronautical Complex (PAC), Kamra and Chengdu Aircraft Industry Corporation (CAC) of China.

Two single-seat F-16C Block 52CFs assigned to 5(MR) Squadron and two double-seater F-16B ADFs assigned to 19(MR/OCU) Squadron.

Fly-by of a four-ship formation comprising one of five Mirage DP two-seat trainers built for the Pakistan Air Force and three Mirage 5EF of 27(TA) Squadron *Zarrars*.


Low-speed pass of an F-16A MLU from 11(MR) Squadron.


High-speed pass of a Mirage 5EF assigned to 25(TA) Squadron.



Two P-3C PUPs assigned to 28(MS) Squadron.

# UNITED NATIONS PEACE KEEPING FORCE IN CYPRUS

**ARTICLE AND PHOTOS** BY
MILITARY AVIATION REACHOUT

One of two Hughes MD500 of the Argentine Air Force in the typical United Nations white color scheme and with United Nations markings. The vertical fins of the horizontal stabilizer are painted in the national colors of Argentina.


The United Nations Peace Keeping Force in Cyprus (UNFICYP) was enacted as a result of a constitutional crises between the Greek Cypriot and Turkish Cypriot communities that gave rise to an outbreak of violence just 3 years after Cyprus became an independent nation in 1960. After all attempts to restore peace failed, the UN Security Council unanimously adopted resolution 186 (1964), which recommended the establishment of UNFICYP. As declared in resolution 186 (1964), UNFICYP's mandate is to use its best efforts to:

- prevent a recurrence of fighting,
- contribute to the maintenance and restoration of law and order,
- contribute to a return to normal conditions.

The mandate is currently carried out by the Argentinian Air Force Flight Unit (ARGAIR) and is based at the former Nicosia Airport within the Buffer Zone between the Greek – Cypriot and Turkish – Cypriot communities.

**Establishment of UNFICYP**

Within three years after Cyprus gained independence in 1960, tensions between the Greek-Cypriot and Turkish-Cypriot communities began to grow. An armed conflict was triggered between both communities on 21 December 1963 which led to heightened violence and the loss of life.

On 26 December 1963, it was agreed that the British Army should participate in a Joint Force also known as the Truce Force. The aim of the Joint/Truce Force was to monitor an already agreed but very fragile ceasefire between Greek and Turkish Cypriots and to prevent further hostilities from breaking out.

Already in Cyprus were RAF Whirlwinds from 230 Squadron and Sycamores of 1563 Flight helicopters and the arrival of 21 (Para) Flight AAC on New Year's Day 1964 added three Scout helicopters and three Auster fixed-wing aircraft to the list of available air assets.

On 15 February 1964, the representatives of the United Kingdom and of Cyprus requested urgent action by the Security Council. It was noted that the situation in Cyprus was likely to threaten international peace and security, hence on the 4 March 1964, with the consent of the government of Cyprus, the United Nations Peacekeeping Force in Cyprus (UNFICYP) was established with the adoption of resolution 186 of the Security Council of the United Nations.

On 27 March 1964, the British Army Truce Force handed over operations to the United Nations and a UN Flight was established at RAF Nicosia using existing assets. Reinforcements, in the form of 19 Liaison Flight AAC, were immediately sent to Cyprus in March 1964 which added an additional three Scout helicopters and three de Havilland Beavers.

On 1 August 1966, the HQ UNFICYP Flight AAC was formed. From now on this unit would have its own dedicated resources with personnel being posted on a three-year rotation.

The RAF continued to occupy part of the site, known as the RAF Nicosia Retained Site. This British "retained site" status gave the United Kingdom the right to exercise exclusive control over the designated area in an emergency. In addition, three former RAF camps close to the airport shared facilities with UNFICYP after the Force's establishment in March 1964. The airport facilities were expanded with a new terminal building in 1968. The runways served both military and civilian aircraft, and by July 1974, Nicosia International Airport was welcoming a strong tourism trade.

Argentina has two Hughes 500D deployed to Cyprus in support of the United Nations Peace Keeping Force.


**Events of 1974**

On 15 July 1974, Greek National Guard officers staged a military coup d'état. For the next four days, the airport was kept busy with commercial flights arriving to evacuate civilians who were primarily tourists.

On 20 July, Turkish forces, responding to the Greek coup, launched a series of air raids on the airport. On 23 July, fighting between Turkish and Greek forces was especially fierce in the airport vicinity. The Force Commander at that time, General Prem Chand from India, ordered UNFICYP to take over the airport, declaring it a United Nations Protected Area. United Nations Headquarters in New York gave its immediate approval, and, with the agreement of the local military commanders of both sides, UNFICYP troops (from Canada, Finland, Sweden, and the United Kingdom) occupied Nicosia airport. The UNFICYP Flight AAC assets with additional Royal Navy helicopters were used extensively during this period.

In keeping with UNFICYP's mandate to maintain the status quo, the airport has remained a United Nations Protected Area since 1974.

Post-1974, helicopter operations remained similar in role but were geographically more defined due to the scattered areas of operations that coalesced into the 180km long Buffer Zone.

**1994 – Handover to the ARGAIR**

In 1994, the UN chose the Argentine Air Force to replace the British helicopter squadron of the British Army, taking over the mission's air component, called ARGAIR. At 4 p.m. on 15 September 1994, a C-130 Hercules 'LV-APW' arrived at Larnaca Airport from Argentina. Inside were two Hughes MD500 helicopters with their commanders, Maj Grazziani and Capt Muller, together with the helicopter group made up of six officers and 10 NCOs.

After unloading and re-assembling, the MD500s made their first flight in Cypriot skies towards the UNPA escorted by a British Gazelle. The helicopter group dedicated its time and efforts to theoretical and practical instructions provided by personnel of the Army Air Corps (AAC).

The Gazelle Squadron of the British AAC handed over all aviation support duties to the newly arrived Argentine Squadron. By 30 September 1994, the Argentine Helicopter Unit "UN Flight" became fully operational with the first flight departing at 7:30 a.m. that same day with an observation task for Sector Four of the Buffer Zone.

In 1998, one of the Hughes 500D was replaced with an ex-Israel Air Force Bell 212 flying non-stop directly from Haifa, Israel to ARGAIR in Cyprus. It carried serial 'H-87'which was redeployed to Argentina in December 2000 and replaced with Bell 212 'H-90'. In February 2006, an additional Hughes was added to the UN Flight. Bell 212 'H-90' operated for some years until it was then replaced again with 'H-86/UNO-136' in 2007. The Bell 212 was again replaced with another in 2017 with serial 'H-84/UNO-024' which is present until this day. The Bell 212 is capable of flying night sorties unlike its counterparts, hence in the near future, another Bell 212 might replace one of the Hughes MD500 to have better coverage and increase operational effectiveness.

Therefore, the UN Flight Unit has three helicopters, with two in operation at all times. The unit is based at the UNFICYP headquarters and is staffed with 35 personnel from the Argentinean Air Force who rotate, depending on their role, every six months or a year.

Using Hughes 500 and a Bell 212 helicopters, the unit conducts patrols along the buffer zone and provides logistical support for UNFICYP operations and emergency assistance such as medical evacuations, as required.

In addition, the latest incorporation of specialized personnel in the fight against fire, not only adds to the capacity of aerial operations of the mission but also can provide a quick response in case of any fire emergency within the United Nations Protected Area or outside, if necessary.

The UN-Flight will provide aviation support to all UNFICYP components during routine and emergency situations within its Area of Responsibility (buffer zone) at day and night in order to increase the operational effectiveness of UNFICYP.



Aviation support may include, but not be limited to:

- CASEVAC/MEDEVAC and emergency flights.
- Search and rescue in Buffer Zone.
- Reconnaissance-Observation, monitoring, and patrolling.
- VIP special flights.
- Logistic Support.
- Mission Staff movement.
- Familiarization Flights, LIVEX (Live Exercise), and Training.

The Argentinean UN Flight peacekeepers regularly demonstrate the skill and flexibility that are derived from working back home in wide-ranging and difficult terrains, such as Antarctica, the Patagonia region, and the warmest areas of northern Argentina.

**UNFICYP Budget**

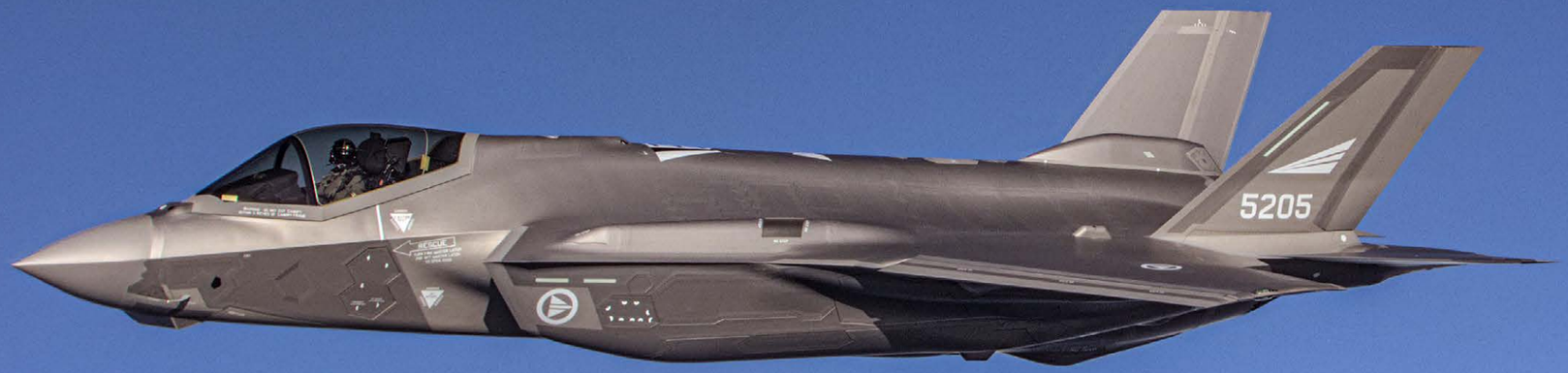
Originally, UNFICYP was supported entirely by voluntary contributions. This resulted in a shortfall, which prompted the UN General Assembly in 1993 (resolution 47/236) to decree that henceforth the costs not covered by voluntary contributions should be borne by the Member States in accordance with Article 17 of the UN Charter.

Nowadays, one-third of UNFICYP's budget is financed by the Government of Cyprus, while the Government of Greece contributes $6.5 million annually. The rest is financed from contributions assessed on the entire membership of the United Nations, as decreed in 1993.

**Top right:** Major Gazziani (left) and Captain Muller (right) are two of six officers and 10 non-commissioned officers of the Argentine Air Force contingent, which includes 35 personnel.
**Above:** At the time of the visit, extensive maintenance work was carried out on the Argentine "UN Flight" Bell 212.

# COLD RESPONSE 2022
## A330 MRTT MEDIA FLIGHT

**ARTICLE** BY JORIS VAN BOVEN
AND ALEX VAN NOIJE




COLD RESPONSE 2022 is a Norwegian military exercise to which Norway has invited NATO allies and partner nations to participate. The most visible part of this exercise took place between 10 March and 10 April 2022.

From early January on, Allied forces have been coming to Norway to train how to operate under harsh winter conditions. COLD RESPONSE concluded most of this allied training but there will be some allied training in Norway also after COLD RESPONSE.

The NATO alliance is the backbone of Norway's defense. Should anyone attack the country, it will invoke Article 5 of the North Atlantic Treaty, and Norway's allies will assist militarily. A credible defense of Norway relies on peacetime allied training and exercises, as well as Norway's ability to receive and absorb allied support. Norway relies on the ability of its allies to cope with the challenging Norwegian weather and winter conditions. To ensure this they have to train and exercise regularly in Norway.

### Participating nations and troops

A total of 27 nations and some 30,000 soldiers signed up for COLD RESPONSE (as of 4 March):

- 14,000 land forces
- 8,000 naval forces
- 8,000 air forces and staff
- about 220 aircraft
- more than 50 vessels


Royal Norwegian Air Force F-35 *Lightning II*s.

In addition to military units from NATO, partner nations, and the Norwegian Armed Forces, several Norwegian civilian agencies and organizations also participated in the exercise. Additionally, 39 Norwegian municipalities were involved in the exercise.

For the first time, the Norwegian F-35As took part in the major exercise COLD RESPONSE. The exercise has provided unique lessons in how the systems across nations and branches talk to each other. COLD RESPONSE also has shown that the F-35 has an important role in the defense of Norway.

From Evenes AB and Ørland AB, 332 Squadron has participated two to three times a day with between six and eight F-35As throughout the COLD RESPONSE exercise. The fifth-generation aircraft is among the world's most advanced and form the backbone of the Norwegian Air Force. During the large exercise, Norway's new fighter aircraft were fully tested. With its unique capabilities, the F-35A is capable of solving missions on a wider range than the Royal Norwegian Air Force has previously done with other fighters. The multi-role aircraft, which indicates that they can fill several different roles on the same mission, have a system that makes them superior in air combat and takes the Norwegian Armed Forces into a new era.

## Media Flight

On 22 March 2022, a media flight in an Airbus A330 MRTT (registration T-058) was organized by the Multinational Multirole Tanker Transport Unit (MMU) and NATO Allied Air Command, flying from the German Cologne-Bonn airport. The air refueling flight was to deliver fuel to aircraft participating in the Norwegian exercise COLD RESPONSE. After take-off, the A330 MRTT flew some two hours to mid-Norway. Six Norwegian Air Force Lockheed Martin F-35 Lightning II fighters were refueled with the refueling boom. One Swedish Air Force SAAB JAS39C *Gripen* fighter simulated the air refueling with the hose and drogue system, as this aircraft type was not yet certified for refueling from the A33 MRTT. Some US Marines Boeing F/A-18s were expected as possible receivers, but these aircraft did not show up.

The call sign of the Norwegian F-35s was "Misty11". Each F-35 took about 5,000 pounds of fuel while refueling. Their mission was SEAD (Suppression of Enemy Air Defense) in support of allied efforts to degrade a simulated threat IADS (Integrated Air Defense System). SEAD is a vital function and role in combined air operations to protect other air platforms from surface-to-air missile systems so that they can perform their primary tasks successfully with minimum risk involved. The F-35 is tailored to this task with its low observable characteristics and excellent sensor suite.

Royal Norwegian Air Force F-35 *Lightning II* assigned to 332 Squadron.

Two Royal Norwegian Air Force F-35 *Lightning II*s accompanied by a *Falcon* DA20 ECM. The *Falcon* is used to jam/disrupt enemy electromagnetic signals and to collect electronic intelligence.

*"The defense capabilities have increased significantly with the F-35. They have participated throughout the exercise in both air-to-air scenarios and air-to-ground scenarios. In 2021, 332 Squadron with F-35 participated in the ARCTIC CHALLENGE Exercise (ACE), which was the first major exercise to integrate the fifth-generation aircraft. This was the second time the F-35 participated in a major exercise, but the first time the Air Force participated exclusively with the F-35."*

*"The F-35 is an important piece in the game. The fighter aircraft facilitates the reduction of the risk of older fighter aircraft with their sensors and unique capabilities. The F-35 has the ability to detect and neutralize threats on the ground, such as enemy air defense."*

Lieutenant Colonel Trond "Matrix" Haugen
Commander 332 Squadron
Royal Norwegian Air Force

Royal Norwegian Air Force F-35 *Lightning II* assigned to 332 Squadron.


Swedish Air Force JAS39C *Gripen* assigned to Flygflottilj F 21 at Luleå AB.

Royal Norwegian Air Force F-35 *Lightning II* assigned to 332 Sqn.


The Swedish *Gripens* can be refueled from the Boeing KC-135, the Lockheed C-130 and some more types. The qualification to be refueled by the Airbus A330-MRTT is pending, therefore there was no real refueling during the Cold Response AAR mission.

# THE MULTINATIONAL MULTIROLE TANKER TRANSPORT UNIT

In 2012, the European Defense Agency (EDA) started to address the long-standing European shortfall in the air-to-air refueling capacity. Since then, this initiative has grown into a mature program managed by the NATO Support and Procurement Agency (NSPA), on behalf of the nations. The Netherlands and Luxembourg initially launched the program in July 2016, with the Netherlands as the lead nation of the project. Germany and Norway joined in 2017, Belgium followed in early 2018, and the Czech Republic lastly joined the Multinational MRTT Fleet (MMF) program in October 2019. In 2020, Luxemburg funded the 9th A330 tanker aircraft. The MMF aircraft are operated by the Multinational Multirole Tanker Transport Unit (MMU) comprising nine A330 MRTT aircraft and personnel from the six partner nations (BE, CZ, DE, LU, NL, NO). The unit is based at two permanent operating bases, the Main Operating Base in Eindhoven, The Netherlands, with five tankers, and the Forward Operating Base in Cologne-Wahn, Germany with four tankers.


## FROM THE COCKPIT OF THE A330 MRTT FLYING OVERHEAD NORWAY

Interview with A330 MRTT pilot in command, LtCol Christian Koernig.

**Can you tell us more about the mission of today?**
The mission of today was in participation of the COLD RESPONSE exercise, which is a big NATO exercise that happens every two years in Norway. And we as MMU participate for the first time this year. Today, we had a mission to support Norwegian F-35s with the fuel that they requested. Besides that, we were also providing fuel for additional receivers if needed. But unfortunately nobody else showed up.

**That is part of the game, can you tell more about your role in the exercise Cold Response?**

Normally, I am "riding a desk", I am the chief pilot on the Forward Operating Base in Cologne, but today, I am "the lucky guy", being the commander of today's mission.

**Can you tell us in depth how you receive an F-35 for a refueling mission?**
From the tasking side, it is more or less that someone makes up his mind about which tanker is assigned to which receiver. So, there is an air tasking order and we will find out eventually that in this air tasking order we will be scheduled with F-35s. When we are airborne and when we are on station, there is a timing (it is timing-based), they will show up normally on the left side, joining from below. And once we cleared them in the vicinity of our aircraft, they will join from the left-hand side. So they wait on the left, they refuel on the center, and wait on the right. And then, they leave high again.

**How many fighters do you receive on average on a mission?**
You cannot judge that; that is depending on the mission. So right now, for COLD RESPONSE, the amount of receivers is not that high. We bring fuel into the area as much as needed and we have spare fuel available if needed for coincidences.

**The Swedish *Gripen* was present but not refueled, what is its role?**
The Swedish *Gripen* was there for the media today. On the technical side, we are also waiting for the clearance of the Swedish *Gripen*. And soon, there is the technical compatibility and when that is done, we also get the clearance for them. Then, in maybe two years, we will also have the *Gripens* as receivers.

**Will the Swedish Air Force be a funder of the MMU in the future?**
Yes we expect that.

**Would that mean that the Swedish Air Force will join?**
They are also participating in big exercises and it does not matter if it is a NATO exercise or another exercise. They are participating in the western hemisphere exercises and they are used to being coalition partners when it goes for the refueling.

**Can you give us detailed information about this flight and the perception?**
Normally, it is just like a domestic flight with an airliner, so we entered the domestic airspace northbound and we left Germany via Denmark and we entered Norwegian airspace. Flying all the way up to the north. We orbited overhead Bodø AB, where the training exercise area was located. Now, we are on the way back via the same way.

**How do you see the future of the MMU?**
Bright! Since we are still growing and still getting into the business as a multinational unit, we are getting more and more together with all the participating nations, and we are getting more and more clearances. Also, the brand "MULTI", which is our callsign, is more and more known to the receiver world. We already made good contacts with the Americans recently. And there will be more, as the Swedish guys. The French are very interested in joining our tankers. Later this year, there will be a big exercise in Australia where we are supposed to go to build relations with the Australians as well. It is a big community, also with this kind of aircraft. There are all over the world multiple nations using the same aircraft and it is now interesting to build a relationship with these nations, to learn from each other, to harmonize and standardize the procedures.

A330 MRTT of the Royal Netherlands Air Force assigned to MMU taxiing to the ramp at Eindhoven AB.

# THE AIRBUS A330 MRTT

The A330 MRTT is able to execute simultaneously three different missions:

- Air to Air Refueling (AAR)
- Transport/ Cargo
- Aeromedical Evacuation (MedEvac)

**MedEvac**

The A330 MRTT is also an outstanding strategic aeromedical evacuation (MedEvac) aircraft. Its large fuselage permits maximum flexibility for up to 130 NATO stretchers to be carried over intercontinental distances. In a "light medevac" configuration, medical beds can be installed above designated fold-down seats. This allows the aircraft to be used as a troop transport on an outbound relief mission, with medical beds stowed in the lower cargo compartments, and then rapidly converted for MedEvac on the return. In an "Intensive MedEvac" configuration, critical care modules can be installed to replicate an intensive care unit in the air. The aircraft could typically carry 28 NATO stretchers, up to six critical care modules, 20 seats for medical staff and 100 passenger seats.

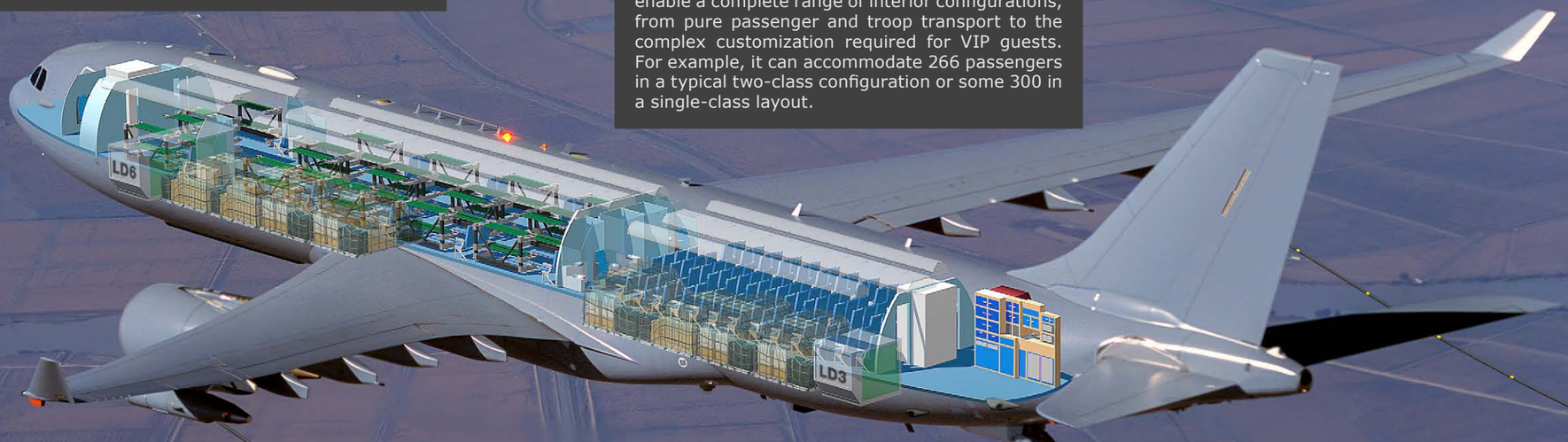
**Passenger transport**

Furnished with an attractively modern design, the cabin is conceived to ensure optimum seating configurations in every class, maximizing capacity and providing airline comfort. These features enable a complete range of interior configurations, from pure passenger and troop transport to the complex customization required for VIP guests. For example, it can accommodate 266 passengers in a typical two-class configuration or some 300 in a single-class layout.

**Fuselage Refuelling Unit (FRU)**

Large probe-equipped aircraft such as the A400M or C295 can be refueled at a high fuel offload rate of 1,800 kg/min – 600 US gal/min via the Cobham 805E Fuselage Refueling Unit (FRU).

The FRU, a removable hose and drogue unit, allows refueling receivers with a different fuel type. This option ensures NATO fuel type is transferred from wing-pods, while an alternative fuel type is dispensed from the FRU.




**Under-wing pods**

Under-wing pods provide simultaneous hose and drogue refueling at high fuel offload rate (1,300 kg/min – 420 US gal/min), allowing receivers to minimize refueling time and increase operation efficiency.

The Cobham 905E under-wing pods, currently in service and proven in t, enable the A330 MRTT to refuel any NATO or allied probe-equipped receivers such as the Eurofighter, the Tornado, the Rafale or the F/A18 Hornet. The A330 MRTT's physical compatibility with receivers across the world is established, demonstrated and certified to allow coalition interoperability.

The 900 series wing-pods incorporate a digitally controlled and electrically operated hose drum unit, optimizing reliability and maintainability.

**Cargo**

The A330 MRTT is capable of carrying a payload of up to 45 tonnes/99,000 lb. The versatility of the A330 MRTT enables cargo to be conveniently stored inside the lower deck in a variety of cargo options covering the full range of existing under-floor cargo containers and pallets, ranging from the LD1 to LD3 to LD6, as well as the standard 88×108 inch 463-L NATO military pallets. Some of the cargo can also be carried as non-palletized "bulk". Commercial containers and pallets as well as military equipment and other large items are loaded through a cargo door.

**Aerial Refueling Boom System (ARBS)**

To refuel receptacle-equipped aircraft such as the F-16 Fighting Falcon, F-35A Lightning II, or another the A330 MRTT (when fitted with a Universal Aerial Refueling Receptacle Slipway Installation, UARRSI), the A330 MRTT is provided with the advanced Airbus Defence and Space Aerial Refueling Boom System (ARBS).

Its fast fuel flow rate (up to a maximum of 3,600 kg/min – 1,200 US gal/min) makes the ARBS the most capable new-generation flight-proven boom available. Excellent handling qualities are provided for the operation of the ARBS, rated as such by independent assessments.

FLASHBACK

# FIRST GRIPENS ARRIVE IN HUNGARY

**TEXT AND PHOTOS**
BY ISTVÁN KELECSÉNYI


The first JAS39 *Gripen* fighter jets have arrived at their new home at Kecskemét AB, taxiing to the flight line for the official welcome ceremony.

They arrived at Kecskemét 16 years ago - the first JAS-39 *Gripen* of the Hungarian Air Force.

On 21 March 2006, the first five Hungarian JAS-39 *Gripen* EBSHU multirole combat jets were flown from Sweden to their new home Kecskemét Air Base. In addition to the Minister of Defense and the General Staff of the Air Force, representatives of the Swedish Embassy and the manufacturer SAAB consortium took part in the reception of the aircraft.

Since October 1993, Hungary had 22 single-seat MiG-29B (9.12) *Fulcrum* combat aircraft and six two-seater MiG-29UB (9.51) combat training aircraft in its inventory. The *Fulcrum*'s capability has declined within a few years due to a lack of hangars, maintenance, and support problems. By the summer of 2002, the aircraft were close to their useful service life. Between 2002 and 2004, fourteen of these MiG-29s (12 single-seaters and 2 double-seaters) had their service life extended. They also were painted similar to the JAS-39 *Gripen*.

Following Hungary's NATO membership in 1999, there were several proposals to achieve a NATO-compatible fighter force. Considerable attention went into studying second-hand aircraft options as well as modifying the nation's existing MiG-29 fleet. In 2001,

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Hungary received several offers of new and used aircraft from various nations, including Sweden, Belgium, Israel, Turkey, and the US. Initially, the Hungarian government intended to procure the F-16. In November 2001, Hungary was negotiating a 10-year lease contract for 12 *Gripen* aircraft, with an option to purchase the aircraft at the end of the lease period. As part of the procurement arrangements, Saab had offered an offset deal valued at 110 percent of the cost of the aircraft. Initially, Hungary planned to lease Batch II *Gripens*. However, the inability to conduct aerial refueling and weapons compatibility limitations caused Hungary to renegotiate the contract. On 2 February 2003, a contract was signed for a total of 14 *Gripens*, which had originally been A/B standard and were extensively upgraded to the NATO-compatible C/D Export *Gripen* (EBSHU) standard.

Three MiG-29s – two single-seat MiG-29Bs and one MiG-29UB two-seater – took off to fly to meet and welcome the Gripens and escort them to Kecskemét AB. Another two MiG-29Bs were in the air as backup, and two MiG-29B aircraft were on QRA.

About a quarter of an hour after the MiG-29s took off, the mixed *Fulcrum* / *Gripen* group entered the airspace over the airbase. The incoming *Gripen* group consisted of five aircraft: single-seat JAS39Cs (EBSHU) with serials 30, 31, and 32 along with two JAS39Ds (EBSHU) double-seat combat trainers with serials 42 and 43. While the Russian-made fighter jets landed, the *Gripens* performed a five-ship formation fly-over, landing right after the last MiG-29 was on the ground.

After all aircraft were parked on the flight line, Lieutenant Colonel Gábor Tóth, commander of the 59/1 Tactical Fighter Squadron (59/1 TFS) Puma, reported to the Minister of Defense János Ságі as well as to the Commander of the Air Force Brigadier General Zoltán Pető the handover of the JAS39 to the Hungarian Air Force.

The last *Gripen* deliveries took place in December 2007. Since 2009, the 59/1 TFS Puma flying the Gripen and the 59/2 TFS Dongó (Wasp) with MiG-29s, the squadrons rotated QRA weekly. The MiG-29 withdrawal from the Hungarian Armed Forces was on 31 December 2010.

In Fall 1993, Hungary received its first MiG-29. A total of 22 single-seat MiG-29Bs **(1, 3)** and six double-seat MiG-29UBs **(4)** were delivered to Hungary in exchange for Russian State debts.

A rare sight: three MiG-29s and five JAS39s **(2)** flying in formation overhead Kecskemét AB.


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**1, 7** This MiG-29B is loaded with six training missiles: two R-27 (NATO code AA-10 *Alamo*) semi-active, radar homing (SARH) beyond visual range (BVR) missiles on the inner pylons and four R-73E (NATO code: AA-11 *Archer*) short-range air-to-air heat-seaking missiles on the four outer pylons.

**2** MiG-29UB rolling down the runway with its nose up and its drag chute deployed to slow the aircraft down without using its brakes.

**3, 5** MiG-29s on the taxiway to the flight line.

**4** Three-ship formation of two MiG-29Bs and one MiG-29UB.

**6** MiG-29UB carrying two R-73E (NATO code: AA-11 *Archer*) short-range air-to-air infrared homing training missiles. Well visible is the mirror between the two cockpit canopies which is extended for landing to give the rear pilot a better forward view.


7



**Top:** Overflight of the first five JAS39 *Gripens* prior to their landing at Kecskemét AB
The first *Gripen* to land at Kecskemét AB was the single-seater '30' **(above left)** and the second one was the double-seater '43' **(above right).**


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The first batch of *Gripens* that arrived at Kecskemét AB consisted of two JAS39Ds **(1)** and three JAS39Cs **(2).** Four Hungarian and three Swedish pilots **(5)** flew the fighter jets directly from Sweden to Kecskemét AB. Lieutenant Colonel Gábor Tóth **(3)**, the commander of the 59/1 "Puma" TFS (Tactical Fighter Squadron) reported to the Minister of Defense János Ságі as well as to the Commander of the Air Force Brigadier General Zoltán Pető the handover of the JAS39 to the Hungarian Air Force **(4)**.

# BACCARAT 2021

**ARTICLE** BY FLY HIGH AEROMEDIA

At the end of October 2021, for two weeks, the 5th annual edition of the exercise BACCARAT took place in southern France. The exercise was hosted by the 4th Air Combat Brigade (4th BAC). The first week was dedicated to preparation, firing, and reconnaissance of the terrain, while the second week was the synthesis of the air-land maneuvering. A total of 1,300 soldiers, 15 units, 32 combat helicopters of the French Armée de Terre, and the Spanish Fuerza Aeromóvilles del Ejército de Tierra (FAMET) participated in the high intensity, real life-size combat simulation. BACCARAT actually started weeks earlier with the exercise CORMORAN 21 with Mistral-class amphibious ships. From the ships, a scenario was created where ground and air assets operated day and night from the ships to stop a virtual enemy and to go ashore and push back the enemy into the mainland.

The stage for this year's exercise were the departments of Aveyron, Lozère, and Cantal. A "playing field" was set out in a rectangle box of about 80km by 120km. The departments were chosen by the fact that they are located in an arid and wild environment. The size of the playing field is immense and challenging, as was the weather. The weather could quickly change from a sunny day to a low clouds day making flight operations difficult to almost impossible. The army base of 13th DBLE (demi-brigade of the Foreign Legion) near the village of La Cavalerie acted as the main combat base. The airfield of Millau-Larzac hosted most of the Armée de Terre and FAMET helicopters.

The main combat base at La Cavelerie was in a provisional field base set up as it would be in a real combat situation. The base consisted of several tents and a central command tent from which all ground and air assets were monitored and coordinated. Not

Armée de Terre NH90-TTH assigned to 1RHC. Even with the autumn colors the NH90 camouflage proves to be quite effective.

only the friendly troops were monitored, but also the enemy positions and losses. The main control room was dominated by two large digital screens. One screen was a large digital map and in case this one should fail, a paper map was manually kept current with the same information. The second screen showed all communications between all the friendly forces. Every recipient had the same line of information and could read all messages, which looked like a large live chatroom. The friendly forces also included virtual troops of several friendly nations like Belgium, Canada, The Netherlands, and the USA. This was done by a representative of that nation who followed the battle strategies and communications like that nation's army would do. In doing so, this created a more realistic and versatile troops alliance. Another key point during BACCARAT 2021 was simulating facing hostile natives when advancing further inland as they were in a different country of different origins.

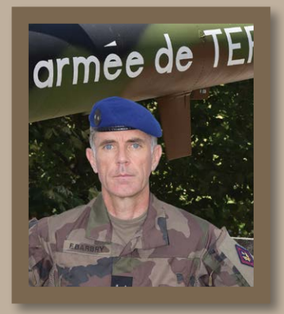
The helicopters were based at a provisional set-up airfield in the same way as at La Cavelerie. This simulated the way as it is in a real-world overseas deployment like Mali for example. Although the Airdrome of Millau-de Larzac was equipped with its own infrastructure like a control tower, the Armée de Terre brought everything they would need in wartime. This included a control tower and controllers, meteorological service, and housing. Besides controlling the helicopters and local traffic, also other traffic in the surrounding area had to be monitored as the region was also utilized by the fighter jets of the French Air Force (Armée de L'Air).

The airfield hosted several types of helicopters: NH90 Caïman, EC665 Tiger HAD, SA342M Gazelle of the Armée de Terre, and EC665 Tiger HAD, AS332B1 Super

**1** French EC-665 Tigre HAD returning from an assault mission in the French hills.
**2** Two pilots of the EC-665 Tiger HAD helicopter of the Spanish Army Aviation at Aérodrome de Millau – Larzac.
**3** EC-665 Tiger HAD of the Spanish Army Aviation going out for a troop support mission in the French hills.

Puma, and AS523UL Cougar of the FAMET. It was the third time that the Spanish FAMET participated in BACCARAT. Captain Ignacio, commanding officer of the FAMET detachment, consisting of BHELA 1 from Ciudad Rea, operatingEC665 Tiger, BHELMA IV from Sevilla with the Super Puma, and BHELEME II AS532 from Valencia flying the Cougar said: "We are very happy to join the French army during Baccarat, they are the best ally for us because we both have the same fleet of helicopters." Both, the Armée de Terre and FAMET, operate the EC665, AS332 and AS532, although not present during this edition, the FAMET also operates the NH90 Caïman. "The EC665 Tigers are the same airframe with only a few differences for the FAMET", Captain Ignacio continues. "The only differences are that we have HF radios and use different air-to-ground rockets. We use the Spike Missile while the French use the Hellfire, both equally capable. The rest, such as the cockpits and the gun, is the same." The FAMET is very keen on joining the exercises as they offer so much more than regular training. The main learning curve comes from the overseas deployment of the Armée de Terre like they currently have in Mali. With the experiences gained during these deployments, they offer so much information about planning and executing missions. "Also, we can update our procedures and share ours with them so we can integrate even more into our corporation in the future", Captain Ignacio continues.

According to Brig. Gen. Barbry, commander of the 4th BAC, BACCARAT brings the Armée de Terre more experience and striking power to improve and maintain air superiority with some of the most advanced military helicopters. From 2005 until 2018, there was a significant gap in large-scale exercises like this exercise. In 2017, BACCARAT was initialized by the Armée de Terre as it was seen there was such a shortfall. The reasons for this were many and varied and were not only due to worldwide military operations. In 2021, Brig. Gen. Barbry and his staff decided to approach BACCARAT '21 on a whole new level and to go one step beyond previous editions by launching a full exercise from the sea and taking it ashore. "Although two different names, CORMORAN and BACCARAT are basically the same exercises and the same enemy we are fighting", Brig. Gen. Barbry explained. "Most of the crews that started during CORMORAN are still here for BACCARAT, only the location of the command post has changed. I am happy to finish the exercise after a couple of weeks of going to bed at 01:00 and waking up at 06:00. To give leadership to a high-intensity battle is very exhausting", he continued. These long days come from the fact that during some parts of the operations, night missions were carried out with



Brigadier Général Barbry

Four Amrée de Terre Tigre HADs are ready to leave on a mission on daybreak.

Armée de Terre Tigre HAD assigned to 1RHC.

some 20 helicopters facing an enemy with advanced anti-aircraft weapons.

Asked about lessons that can be learned from BACCARAT to bring to current global operations, the general replied that the other way around, lessons learned from fighting in Mali or Afghanistan can be incorporated into BACCARAT. "(…) we are still learning from the way the enemy fights and how they use the more advanced weapons", the General added. He even hopes to bring the 2022 edition to another level and include more partners to offer more opportunities. "We would like to welcome all of our partners, Spain, Germany, and so on to BACCARAT 2022 because training in high-intensity warfare is only possible within a coalition. We will not engage or perform any kind of high-intensity fight alone. We need to train with our partners", Brig. Gen. Barbry concludes.

Armée de Terre NH90-TTH assigned to 1RHC.

**Main image:** The loadmaster of an Armée de Terre NH90-TTH assigned to 1RHC oversees the start-up procedure.

**Inset:** French NH90 TTH pilot prepares for her next mission.

Armée de Terre NH90-TTH assigned to 1RHC.

Armée de Terre NH90-TTH assigned to 1RHC.
Some mission were flown at treetop height.

A Spanish Fuerza Aeromóvilles del Ejército de Tierra AS532UL *Puma* assigned to BHELMA IV and – in the background – a Tiger HAD of BHELA1 taking off for a new mission.

# SERBIAN SHIELD 22

**REPORT** BY ISTVÁN KELECSÉNYI

The Serbian force development program started after the 78 days of the NATO air war in 1999. Yugoslavia, of which Serbia was the central power after the Balkan Wars, which made Slovenia, Croatia, and Bosnia and Herzegovina independent states, suffered another major territorial loss with the annexation of Kosovo, which was imposed by the Western powers.

NATO's air war destroyed many economic and military targets, including bridges, power stations, oil refineries, and factories. The Serbian military arsenal suffered heavy losses, especially in the infrastructure of aircraft, air defense units, and airfields.

Serbia unveiled its force development program in 2016, which also led to a transformation of the force organization in 2019.

The Stít 22 (Shield 22) event took place at Batajnica airbase. Almost the entire armament of a battalion combat team was on display, some of which was used for a dynamic demonstration. Air Force and Air Defense armament was also on display, together with newly acquired Russian and Chinese equipment.

In terms of helicopters, the unarmed and armored versions of the former Yugoslav-made SA.342 *Gazelle* helicopters are still flown, but the old Mi-8 helicopters have been replaced by modern Mi-17 and Mi-171/Mi-8MTV (NATO code *Hip*) versions and Mi-35 NATO code *Hind*) Russian combat helicopters. The latter are also offered for sale by the Cypriot Air Force outside the country of manufacture.

The soldiers who swarmed out of the Mi-171 - Mi-8MTV5 (Serbian designation HT-49) also piloted several BOV M16 *Miloš* 4x4 multipurpose armored vehicles (MPAV), small remote-controlled robotic tanks. There are several *Miloš* variants: with a machine gun, submachine gun, and anti-tank missiles, versions for reconnaissance, radar detection, and other combat support tasks.

1 The Mi-171 - Mi-8MTV5 (Serbian designation HT-49) medium transport helicopter, also a Russian acquisition, can be equipped with considerable firepower. It can also be used for CSAR (combat search and rescue) missions.

2, 3 An old Mi-8T (Serbian type designation H-40) transport helicopter was used to get soldiers on the ground using "fast rope" technology.

An H-40 / Mi-8T (background) and an HT-49 / MI-8MTV5 (background) transport helicopter with special operation forces on board arrive for a CSAR and assault demonstration. The difference between the two Mi-8 versions is clearly visible.

Air force development is the most-costly, so modernization is based on rational decisions. The remaining MiG-21 aircraft from the war have been withdrawn and their fighter aircraft are left with four MiG-29As and a single UB aircraft, which were the oldest MiG-29 *Fulrum* variants in Europe. One of the fighter variants was shot down. From 2017 onwards, Russian MiG-29C (9.13) and UB (9.51) and Belarusian MiG-29C (9.13) fighters were provided with military aid. The *Fulcrums* came in several sub-variants and with slightly different instrumentation, but the domestic MOMA is rebuilding them as SM variants in cooperation with the Russian manufacturer. In addition to several air-to-surface guided missilies, the modernized fighters have been integrated with the R-77 (NATO code AA-12 *Adder*) Russian active locator guided BVR missile. The Serbs have acquired new versions of the inertial and semi-active radar-guided R-27ER1 (NATO code AA-10 *Alamo*) missiles. The range of the target is 110-130 km, unlike the older R-27R1 missiles, which had a range of 50-60 km. The R-27ER1 missile (470-1E products) has a maximum speed of 4.5 Mach, a weight of 354 kg, and a warhead-weight of 39 kg. As with the R-27R1, only two R-27ER1 missiles can be carried on the MIG-29.

The Russian-Ukrainian war is also threatening the supply of MiG-29 fighters, and the type is obsolete with its predominantly analog instrumentation from the 1970s. However, they are perfectly suited for air policing missions. In March 2022, Serbia turned to the EU to order a squadron of the Dassault Rafale, which is also in service with Croatia.
Some of the MiG-29s aircraft had dark and others light grey radar nose-cones. This might lead to the speculation as to which aircraft of which registration number received the MiG-29SzM modernization, or perhaps the different livery distinguishes the aircraft that are ex-Belarusian and ex-Russian.

Four Serbian Air Force MiG-29C (9.13). The first is ex-Russian Air Force and the following three are ex-Belarusian Air Force.

**Main image:** This Serbian Air Force MiG-29 (9.13 variant) formerly served in the Belarus Air Force.

**Insets:** MiG-29A (9.12A), from the first delivery in 1987. The exhibited example probably has not yet received the MiG-29SzM upgrade.

**Top:** Flight line with four MiG-29C (9.13) and one MiG-29UB (9.51).

**Left:** MiG-29C, Serbian designation 9.13.

**Right:** MiG-29UB (Serbian designation Nasztavnyi Lovac NL-18, NL-19) training fighter aircraft. It is not equipped with a locator, so it cannot carry radar-guided missiles. Its air combat armament may consist of six R-60 or R-73E heat-seeking missiles in addition to a 30mm machine gun.


The licensed production rights for the Aerospatiale SA.342 helicopter, together with the Astazou IIB engine, were purchased by Yugoslavia. Of these, several variants were produced: HO-42, HI-42 *Hera*, HS-42, and HS-42M *Gama* and HN-45M *Gama*.

In addition to the unarmed HO-42 series, the SA.341H (HM-42M *Gama*) variant can also carry 9K11 Malyutka anti-tank missiles, and can therefore be used for anti-tank missions.

The guidance system for the anti-tank missile is mounted above the cockpit. The *Gama* can carry four missiles.

The HN-45M *Gama 2* variant is the latest modernization. It can carry a variety of unguided missiles and missile containers, as well as the modernized Malyutka 2T5 and Pauk anti-tank missiles.

**Top row:** SA341H (HN-42M)

**Right:** SA341H (HI-42)




The European Union's Airbus H-145M multi-purpose helicopter was also purchased, but was fitted with domestically manufactured unguided missiles and machine gun containers, while the Hungarian force purchased armament manufactured by the Belgian company Herstal.

The first examples of the Airbus H145M light multi-purpose helicopter have also been put into service. The Serbs have also completed their first live firings, but they do not yet have guided missiles.

The Serbs, however, have integrated their own non-guided missile armament and machine gun container into the H145M rotary-wing HForce weapon system.

However, the radar irradiation beacons and active countermeasures system (infrared trap scatterer) are identical. The exhibited helicopter does not have a Wescam MX-15D sensor sphere and a guided anti-tank missile cannot be used without it.

**Top right:** H145M carrying a container for unguided missiles.

**Below left:** H145M in an unarmed configuration.

**Below right:** This H145M is carrying a machine gun container.



Among the latest helicopter acquisitions in the force armament program, the Mi-35 (Serbian type designation HT-47) attack helicopters procured from Russia were also presented. This version, now with a rigid landing gear, has shorter wings and no separate pylon for an anti-tank missile at the end.

The tail rotor, similar to the U.S. AH-64, is "X" shaped, which makes the helicopter quieter, among other things. Both, guided 9M120 Ataka (NATO code AT-9 *Spiral 2*) and unguided missiles were on display. Below the front cockpit is a sensor ball, and the built-in firearm is a rotating 23mm machine gun. However, the Vityebsk anti-missile system was not fitted to the export examples.

Mi-35 (HT-47) combat helicopter, registration number 104. Mounted under each stub-wing is a container that holds non-guided Sz-80 rockets .

**Insets:** Mi-8MTV5, Serbian designation HT-49.

**Main Image:** A Mi-8MTV5 (HT-49), two H145M, and one Mi-35 (HT-49) waiting for the take-off clearance for their dynamic display.


The SOKO G-4 Super Galeb (Serbian designation H-62) is a jet-powered training and light attack aircraft. About 20 of the type are still in service, of which nearly half are upgraded G-4Sz, T, and M variants. The Super Galeb has a maximum speed of 900 km/h.

The G-4M Super Galeb can carry a wide range of weapons: BL-775 cluster bombs, unguided 350 kg (770) lb and 250 kg (550 lb) bombs, machine gun containers, and air-to-air missiles on up to four hardpoints and on the outer pylons. The centerline pylon can also carry a twin-barrel 23mm Gsh-23mm machine gun container. External fuel tanks can be attached to the inner pylons.

The orange-white Super Galeb above is a pre-production G-4T (Serbian designation N-62T), serial number 23601, and is used as target-tow aircraft.

# SOKO J-22 *Orao*



The J-22 *Orao* was also called the Eastern Jaguar, after the British-French strike aircraft of similar design and mission. The Romanian-Yugoslavian-developed strike aircraft is now in service only in Serbia. The Romanian (IAR-93 Vultur) versions, which were built to a much lower technical standard and quality, have been withdrawn.

In this picture, the integrated Gsh-23L 23mm machine guns in front of the air intake opening are clearly visible. Interestingly, the aircraft have a MIL-STD-1553 NATO standard data bus.


The modernization program for the two-seat variant NJ-22, called Orao 2.0, began in 2016. By 2022, only one or two prototypes are still flying, although the cockpits have been updated and the integrated armament has been expanded to include laser-guided missiles, for example. There will be no modernization of the single-seat J-22.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**1** The Serbian Air Force Utva Lasta 95 is used for basic flight training. The Serbian Air Force has 14 aircraft of this type in its inventory.

**2** An Utva 75 Sova (B-53) four-seat touring and training aircraft.

**3** A veteran An-26 troop transport took part in the dynamic display. Two other An-26s were in the static display, however, this is supposed to be the only one in flying condition.

**4** The modernized Utva Lasta can be equipped with some weapons.

**5** Piper PA-34 Seneca aircraft, of which only one is in service. The twin-engine aircraft is used for passenger and VIP transport.


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Drones should not be missing from the equipment of a modernized force. Several mainly experimental and mock-up UAVs were on display.

**1** Strike drone with mock-up armor-piercing missiles.

**2** Medium size helicopter drone with mock-up missiles.

**3** Combat drone, assembled and in a portable state. It can be fitted with a small sensor camera.

Shield 22 provided an opportunity to see almost all the combat and combat support vehicles in service with the Serbian Army. The equipment of the Serbian ground forces is constantly being upgraded and is mainly equipped with self-developed equipment. At the same time, Serbia's economic and military policies are also noncommittal, so they have Western (European Union) and Russian equipment and systems and are acquiring more modern technical equipment from both. China has also become a potential partner in recent years.

The air defense still uses the older S-125 Nyeva (NATO code SA-3 *Goa*) missile systems. With Russian assistance, the S-125 Nyeva received the Pechora-M upgrade which affected almost all components, in particular radar, guidance, electronics, and the warhead. Also, a laser/infra-red tracking device was added, which allows the launching of missiles without using the radar. However, these are hopelessly outdated, as the first examples were already used in the Vietnam War. Serbia has 32 launchers in 12 batteries.

Also in service with the Serbian Army are 87 self-propelled 2K12 Kub (NATO code SA-6 *Gainful*) upgraded mobile surface-to-air missile systems. For protection against low-flying aircraft and helicopters Serbia uses the Russian-made 9K35 Strela-10 (NATO code SA-13 *Gopher*) highly mobile, short-range surface-to-air missile system.

A new asset in their inventory are six Russian self-propelled Pantsir S-1 (NATO code SA-22 *Greyhound*) anti-aircraft systems. The Pantsir S-1 is a short to medium-range surface-to-air missile and anti-aircraft artillery system to protect civil and military point targets against aerial threats like aircraft, helicopters, ballistic and cruise missiles, guided bombs, and UAVs. In the near future, it will be upgraded to the S1M variant with an upgraded search radar that can track up to 40 targets at the same time and a new fire-control radar that is capable to engage four targets simultaneously. The S1M upgrade includes new missiles with an increased ceiling, engagement range, speed, and a 25 kg fragmentation warhead instead of the current 20 kg warhead.

Instead of the Russian S-300PMU2 (NATO code SA-10 *Grumble*) medium and long-range air defense system, Serbia decided to acquire the Chinese FK-3 (export version of the Chinese HQ-22, NATO code *Red Banner 22*) missile system with similar parameters. This included H200 fire control radars, command posts, and missile transport vehicles. Although not officially confirmed, Serbia is said to have acquired four batteries. Each battery consists of four launcher vehicles with four missile tubes each and one JSG100 AESA search radar. The H200 fire-control radar can simultaneously display 30 targets, track 16 targets and engage six targets with 12 missiles at an altitude of between 50 m and about 27 km. The range is at least 100 km. The FK-3 systems were delivered on 9 and 10 April at Nikola Tesla Airport by 12 Chinese People's Liberation Army Air Force Y-20 airlifters.

**Main Image:** FK-3 surface-to-air missile launcher, manufactured in the People's Republic of China and in the background a Pantsir S-1 (NATO code SA-22 *Greyhound*) anti-aircraft system.

**Inset:** H200 fire-control radar for the FK-3 system.


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1 S-125 Neva/Pechora M (NATO code SA-3 *Goa*) surface-to-air anti-aircraft and anti-cruise missiles radar-guided missile system for low and medium altitudes. Serbia has 32 launchers. The Soviet army received the first S-125 in 1961.

2 9K310 Igla, a soviet-made, man-portable IR homing SAM system.

3 SPU launch vehicle of the 2K12 KuB (NATO code SA-6 *Gainful*) mobile surface-to-air missile (SAM) system. The 2K12 is a Soviet low to medium-level air defense system. It is designed to protect ground forces from attacking aircraft. It is loaded with three 3M9M4 anti-aircraft missiles.

4 Modernized SPU launch vehicle of the 2K12 KuB air defense missile system. The two outside anti-aircraft missiles are 3M9M4s. A triple launcher has been installed in place of the central missile. It can launch two R-60 (NATO code AA-8 *Aphid*) and one R-73E (NATO code *Archer*) infra-warhead missiles.

5 P-40 (NATO code *Long Track*) high-mobility 3D-radar system was developed in the Soviet Union in the early 1960s. It is capable to detect and track aerial targets at a maximum range of about 170 km.

5

# SWIFT RESPONSE 2022

**TEXT AND IMAGES** BY IGOR BOZINOVSKI UNLESS STATED


For the exercise Swift Response, the U.S. deployed three A-10C *Thunderbolt II* aircraft assigned to 104th FS, Maryland Air National Guard to North Macedonia.

On 8 May, the Macedonian Army's training range Krivolak at Stenkovec sport airfield (LW75), located 9 km north-west of Skopje, was the scene of the display of aircraft/helicopters that took part in the exercise SWIFT RESPONSE 2022.

Participating in the event were US, UK, Greek and Macedonian aircraft. Dominating the static display was the sand-colored United States Army Aviation (USAA) Boeing CH-47F *Chinook* parked alongside the Macedonian Air Force Mi-8MT transport helicopter.

Not less attractive were two USAA Sikorsky *Black Hawk* helicopters: a MEDEVAC (medical evacuation) configured Sikorsky HH-60M Black Hawk and the multi-mission UH-60M. The star of the static, however, was the Westland WAH-64 *Apache* AH.1 which was the representative of the Army Air Corps (AAC), the combat aviation arm of the British Army.

The helicopter static line also saw presence of additional two Macedonian government rotorcraft: the Police Helicopter Unit's Agusta-Bell AB.206B *JetRanger II* and Agusta-Bell AB.212.

Among the government-owned aircraft also seen at Stenkovec was the United States Army AAI Corporation RQ-7 Shadow unmanned aerial vehicle (UAV) shown with the two accompanying AM General 4x4 High Mobility Multipurpose Wheeled Vehicles (HMMWVs, colloquial: Humvees).

The event was enriched by the fly-pasts of three fuel tanks-carrying Hellenic Air Force Lockheed Martin Block 30 F-16C *Fighting Falcon* jet fighters belonging to the Nea Aghialos-based 330 squadron, a unit subordinated to the 111th Combat Wing of the Hellenic Tactical Air Force. These aircraft came directly from Greece, and after the fly-past returned to their home base located almost in the middle between Thessaloniki and Athens.

The F-16s were followed by a fly-past and a follow-on simulation of a Close Air Support (CAS) mission by a pair of U.S. Air Force (USAF) Fairchild Republic A-10C *Thunderbolt II* single-seat, twin-turbofan, straight-wing, subsonic attack aircraft. These two jets are part of the Maryland Air National Guard (MD ANG) A-10C contingent deployed to Ohrid airport in Macedonia since 7 May. Officially, they are part of MD ANG's 175th Wing stationed at Warfield Air National Guard Base, located 17 km east of Baltimore, Maryland, United States.

SWIFT RESPONSE is an annual U.S. Army Europe and Africa multinational training exercise. This year, it took place in Eastern Europe, the Arctic High North, Baltics, and Balkans. Approximately 9,000 service members from 17 NATO-allied and partner nations participated in the exercise, including approximately 2,700 U.S. soldiers and airmen. SWIFT RESPONSE 2022 was the biggest international military exercise ever held in Macedonia with about 1,000 paratroopers planned to conduct an airborne assault. The exercise saw operations in Macedonia of a total of around 4,600 soldiers and 45 aircraft from the NATO allied nations US, UK, Italy, France, Macedonia, Montenegro, Albania and Greece.

An A-10C *Thunderbolt II* aircraft assigned to the 104th Fighter Squadron, Maryland Air National Guard, arrives at Ohrid St. Paul The Apostle Airport in Ohrid, North Macedonia.

***Photo: U.S. ANG by MSgt Christopher Schepers***

## SWIFT RESPONSE 2022

This spring U.S. Army Europe and Africa will demonstrate its ability to conduct near-simultaneous airborne operations from the Arctic Circle to the Balkans region during Swift Response.

Exercise Swift Response is an annual U.S. Army Europe and Africa multinational training exercise that takes place this year in Eastern Europe, the Arctic High North, Baltics, and Balkans from May 2-20.

Planning for this exercise began in 2021 and is not in response to any specific threat or adversary.

Approximately 9,000 service members from 17 Allied and partner nations will participate in the exercise, including approximately 2,700 U.S. Soldiers and Airmen.

Swift Response exercises U.S. Army Europe and Africa's ability to rapidly deploy beside European multi-national airborne forces with little to no warming across the globe. The purpose is to present combat credible Army forces in Europe and Africa and enhance readiness by building airborne interoperability with Allies and Partners and the integration of joint service partnership.

During the exercise, Southern European Command Task Force-Africa will oversee five near-simultaneous Joint Forcible Entries, or airborne operations, over the course of 96 hours.

The exercise begins when the 4th Brigade Combat Team (Airborne), 25th Infantry Division leaves Alaska and flies over the North Pole to Norway. The flight, and subsequent airborne jump into Norway, will demonstrate the unit's ability to conduct arctic defense operations with Allies and partners in the Arctic High North.

At nearly the same time, paratroopers from the 173rd Infantry Brigade (Airborne) and 82nd Airborne Division, and several allied airborne units, will conduct separate JFEs into Latvia, Lithuania, and North Macedonia. Once the airborne assaults are complete, each brigade task force will conduct on-the-ground tactical operations and follow-on training, to include rotary wing deep-strike attacks, air-assault operations, live-fire training and field-training exercises.

***Source: U.S. Army Europe and Africa***

**Top row:** The A-10s impressively demonstrated their maneuverability.
**Bottom row:** Three A-10C *Thunderbolt II* aircraft assigned to 104th FS, Maryland ANG, taxi after landing at Ohrid St. Paul The Apostle Airport in Ohrid, North Macedonia, May 7, 2022. They are ready to conduct Agile Combat Employment training in support of the SWIFT RESPONSE exercise. ***Photos: U.S. Air National Guard by MSgt. Christopher Schepers.***



**Top:** Greece participated in SWIFT RESPONSE with F-16 *Fighting Falcons* assigned to 330 Squadron based at Nea Aghialos AB.
**Above:** U.S. Army RQ-7 *Shadow* unmanned aerial vehicle (UAV) used for reconnaissance, surveillance, target acquisition, and battle damage assessment.

Westland WAH-64 Apache AH.1 assigned to 653 Squadron of the Royal Army Air Corps.

U.S. Army Sikorsky HH-60M *Black Hawk* in MEDEVAC configuration. The helicopter is assigned to 2nd Battalion, 227th Aviation Regiment, 1st Air Cavalry Brigade (2-227th AVN REGT) at Fort Hood, Texas.



Soldiers assigned to the British 16th Air Assault Brigade Combat Team load and take off in a 1st Air Cavalry Brigade UH-60 Black Hawk helicopter in preparation for an air assault training mission during SWIFT RESPONSE at Krivolak Military Training Center, North Macedonia.

***Photos: U.S. Army, 1st Air Cavalry Brigade, Sgt. Jason Greaves)***

A North Macedonian Air Force Mi-8MTV-2 *Hip* is about to land next to a U.S. Army Sikorsky HH-60M *Black Hawk*. This Mi-8 previously served in the Ukrainian Air Force.


**Main Image:** The Police Helicopter Unit presented an Agusta-Bell AB.206B *JetRanger II* (registration MAP-7750) and an Agusta-Bell AB.212 (registration MAP-7751) at the Open Day.

**Inset:** Zlin 143L, ex Macedonian Air Force and now in service with the North Macedonian Civil Aviation Authorities.

# LEONARDO SAR WORKSHOP

## MALTA 26 TO 29 APRIL 2022

**REPORT** BY ANTHONY SEYCHELL


The Canadian Forces define 'Search and Rescue' as the search for, and provision of aid to persons, ships, or other craft which are, or are feared to be, in distress or imminent danger. Additionally, the United States Coast Guard states that SAR involves the use of available resources to assist persons or property in potential or actual distress. SAR is not something that was started in the 20th century. There are records of 'SAR' missions going as far back as the 17th century. Skipping a few centuries, we come across the first use of a helicopter in a SAR mission in November 1945 when a Sikorsky R-5 performed the first civilian helicopter rescue operation in history. Since that day, the helicopter has been an important asset in the provision of SAR, particularly when it comes to the rescue part.

In late April of 2022, Leonardo, a global high-technology company and a leading helicopter manufacturer, organized the first Search and Rescue Workshop in Malta. During this event, Leonardo highlighted advancements in life-saving rotorcraft capabilities and technologies to international operators, industry representatives, and institutions. The main focus was on SAR operations experience and needs in the Mediterranean Sea, and the workshop was attended by around 90 participants from eleven countries in the Mediterranean area. During the event, Leonardo illustrated its recently launched MITHOS (Modular Interactive Trainer for Helicopter OperatorS), a fully immersive and interactive operational training for hoist operators, pilots, rescuers, and medical operators. MITHOS uses the latest state-of-the-art augmented reality to reproduce realistic helicopter hoist operations and all types of rescue scenarios.

A small static display of five helicopters was part of the event and the workshop attendees had the opportunity to visit and inspect these helicopters at Safi Park, just across from Malta International Airport. On 26 April, the first helicopter to arrive was MM82041/11-18, a PH139E from the Italian Coast Guard. It was rapidly followed by an Italian Naval Aviation AW101 ASW/ASuW, MM81484/2-05, the Italian Guardia di Finanza MM81964/GF-414, a PH139D, resplendent in its special 1,000 markings (the 1,000th AW-139 built) and MM82030/15-74, an HH139B from the Italian Air Force. Concluding this small fly-in was one of the local AW139s operated by the Armed Forces of Malta Air Wing, AS1630.

The presence of four AW139s was intrinsic to the event's organization and objectives. To date, more than 1,100 AW139s are in service with more than 280 customers in around 90 nations. These helicopters have logged over 3.3 million flight hours. Almost 400 military, parapublic and civil-operated AW139s carry out emergency and disaster relief operations worldwide and have amassed more than 900,000 flight hours to date.

From the spotters' point of view, there were two more aircraft participants. These were not helicopters but they were equally interesting because they were two Piaggio P180 Avantis, which brought delegates from the Italian Corpo Nazionale dei Vigili del Fuoco (National Firefighters Corps) and the Italian Coast Guard. The two aircraft were DVFN/VF-182 from the Vigili del Fuoco Reparto Volo Nazionale and MM62274/12-01 from the Guardia Costiera 2° Nuclea Aereo.

The event concluded with the Italian helicopters leaving Malta on Friday 29 April. Leonardo's first SAR workshop was well-received from all the attendees and participants. It is sincerely hoped that Malta, located centrally in the Mediterranean between southern European and northern Africa, would have the opportunity to host further such events.

Acknowledgments

The author wishes to acknowledge the support and assistance of the Malta Aviation Society who made possible the visit to Safi Park and the Ufficio Stampa – Communication, Leonardo S.p.a. for the detailed information about the event and Leonardo Helicop.

Italian Coast Guard PH-139E of the 1ª Sezione Elicotteri.




PH-139D of the Italian Guardia Di Finanza (GdF). The GdF is a militarized police force and part of the Ministry of Economics and Finance. Its primary tasks are to fight financial crimes, drug trafficking, and to patrol Italy's territorial waters.




**Top:** Line-up of an Italian Air Force HH139B of 81° Centro AE, Armed Forces of Malta AW139 of the Air Wing, and an Italian Naval Aviation EH101-110 ASW/ASuW PH-139D of GRUPELICOT (left to right). **Above left:** Armed Forces of Malta AW139. **Above right:** Italian Air Force HH139B.






Italian Naval Aviation EH101-110 ASW/ASuW PH-139D of GRUPELICOT.


Piaggio P180 *Avanti* of the Italian Coast Guard.


This Italian Piaggio P180 is operated by the Corpo Nazionale dei Vigili del Fuoco (National Firefighters Corps).

# FRENCH AIR FORCE PRESENTATION AT BA 105 EVREUX

**ARTICLE** BY JORIS VAN BOVEN
AND ALEX VAN NOIJE


On 10 November 2021, the French Air Force (L'armée de l'Air et de l'Espace) presented an overview of its capabilities and missions to the auditors of the Institut des Hautes Etudes de Défense Nationale (Institute for Higher National Defense Studies, IHEDN) and the Ecole de Guerre (War College, EDG), at the Base Aérienne 105 Evreux *Commandant Viot*.

The various presentations illustrated the capabilities of the French Air Force: a powerful air force, guaranteeing air superiority, while staying ahead and cultivating the moral strength of airmen. Today, the French Air Force is about to take on new challenges: "to see higher, to decide faster, to be stronger".

The static display presented the following French Air Force aircraft:

- 1 Airbus A330 MRTT *Phenix*
- 1 Airbus A400M *Atlas*
- 1 LockheedMartin C-130J *Hercules*
- 2 Dassault Rafale
- 1 Pilatus PC21
- 1 Beechcraft King Air 350
- 1 EuroCopter EC725 *Caracal*

Close to the aircraft and helicopter, the crews were gathered to answer questions from the participants. On another platform, ground-based units of the French Armed Forces like the Ground-to-Air Defence units demonstrated their capabilities.

The dynamic presentation was performed by some aircraft from the static show:

- 1 Airbus A30 MRTT *Phenix*
- 1 Airbus A400M
- 1 LockheedMartin KC-130J *Hercules*
- 1 Pilatus PC21
- 2 Dassault Rafale, flying from another location of the airbase
- 1 German Air Force C-160 Transall, flying from another location of the airbase

During the dynamic presentation, two Rafale fighter jets and the PC21 took off and later, the PC21 was intercepted during a 'slow-mover interception' whereby the PC21 was forced to land afterwards.
Then, the A400M flew by and dropped a number of paratroopers, followed by the landing of the KC-130J. After landing, soldiers departed the C-130 via the open ramp to take up defensive positions. Finally, the old and venerable C-160 landed at the airbase.

Two Rafale Cs assigned to EC02.030.

Airbus A400M *Atlas* assigned to ET01.061




Soldiers departing the KC-130J immediately after landing to secure the area.

For the first time, the recently established Franco-German tactical transport squadron EFATT demonstrated its new LockheedMartin KC-130J Hercules. After the formal decision to establish a mixed tactical transport squadron in 2017, work started at BA Evreux to create a huge new apron with large hangers to house the future aircraft. Also, orders were placed at LockheedMartin. The mixed squadron will have 10 aircraft: two French C-130J, two French KC-130J, and six German C-130J. All French C-130Js have been delivered and the first German Hercules (serialed 55+01) had been transferred to Évreux by U.S. Air Force pilots and officially entered service on 8 March 2022. Initial Operating Capability (IOC) was reached in September 2021 and Full Operational Capability is expected in 2024. By then the final C-130J should have been delivered. Franco-German airlift squadron was officially commissioned at Evreux AB on 9 March 2022.

One of the two French Air Force KC-130Js assigned to the Franco-German tactical transport squadron.


▲ French Air Force KC-130Js assigned to the Franco-German tactical transport squadron
▼ French Air Force Transall C-160R assigned to ET01.064


French Air Force KC-130Js assigned to the Franco-German tactical transport squadron ▲
German Air Force Transall C-160D assigned to Lufttransportgeschwader 63 ▼



▲ French Air Force Beech 350ER/ALSR assigned to EEA01.054
▼ French Air Force DHC-6-300 assigned to GAM00.056


French Air Force A330MRTT assigned to ERVTS01.031 ▲
French Air Force PC-21 assigned to EPAA00.315 ▼

# VULCAN PHOTO SESSION

**ARTICLE** BY KRIS CHRISTIAENS AND GERT TRACHEZ

On the weekend of 1 May 2022, we visited London Southend Airport in Essex, England, for a unique sunset and night shoot with an Avro Vulcan bomber. This event was organized by Timeline Events in collaboration with the Vulcan Restoration Trust which is a registered charity that owns and maintains the ex-Royal Air Force Avro Vulcan B2 XL426. The beautiful delta-shaped wing Avro Vulcan is one of the most iconic aircraft produced in Great Britain since the end of the Second World War and was part of the Royal Air Force's legendary 'V-Force'. Because the Avro Vulcan B2 was part of the 'V-Force', this bomber became the backbone of the United Kingdom's airborne nuclear deterrent during most of the Cold War. This bomber aircraft also played an important role in Operation Black Buck during the Falklands War between the United Kingdom and Argentina.

The Avro Vulcan at London Southend Airport served with the Royal Air Force from 1962 to 1986 and was transferred to the Vulcan Restoration Trust in 1993. XL426 was the 44th of the 88 Vulcan B2s built and made its first flight on 23 August 1962 from Woodford Aerodrome. She entered service with 83 Squadron at RAF Scampton and became part of 50 Squadron at RAF Waddington in January 1982. This aircraft was one of the four Vulcans that took part in the Falklands Victory Flypast over London on 12 October 1982 and later was kept airworthy for air display purposes. Together with XH560, XL426 formed the famous Vulcan Historical Flight. In the summer of 1986, XL426 was put up for sale and was sold to Roy Jacobsen on 19 D1986. On arrival at London Southend Airport, XL426 had 6,236 hours of flying time on its counter, having made over 1,800 flights.

This special photo shoot was organized on the occasion of the 40th anniversary of Operation Black Buck. During the 1982 Falklands War, Operation Black Buck was a series of seven extremely long-range ground attack missions by Royal Air Force (RAF) Vulcan bombers of the RAF Waddington Wing. The objective of this complicated military mission was to attack Port Stanley Airport and its associated defenses. The attack began on 30 April 1982 and was the first of seven raids on the airfield and anti-aircraft radar installations. This military operation was so complex because 11 tanker aircraft were needed to refuel the Vulcans - the bombers had to fly 6,900 km from RAF Waddington to Ascension Island and then another 6,100 km to the Falkland Islands. While seven raids were conducted, only five of them were successful. One Vulcan was almost lost when a fuel shortage forced it to land in Brazil. The Operation Black Buck raids were the longest-ranged bombing raids in history at that time.

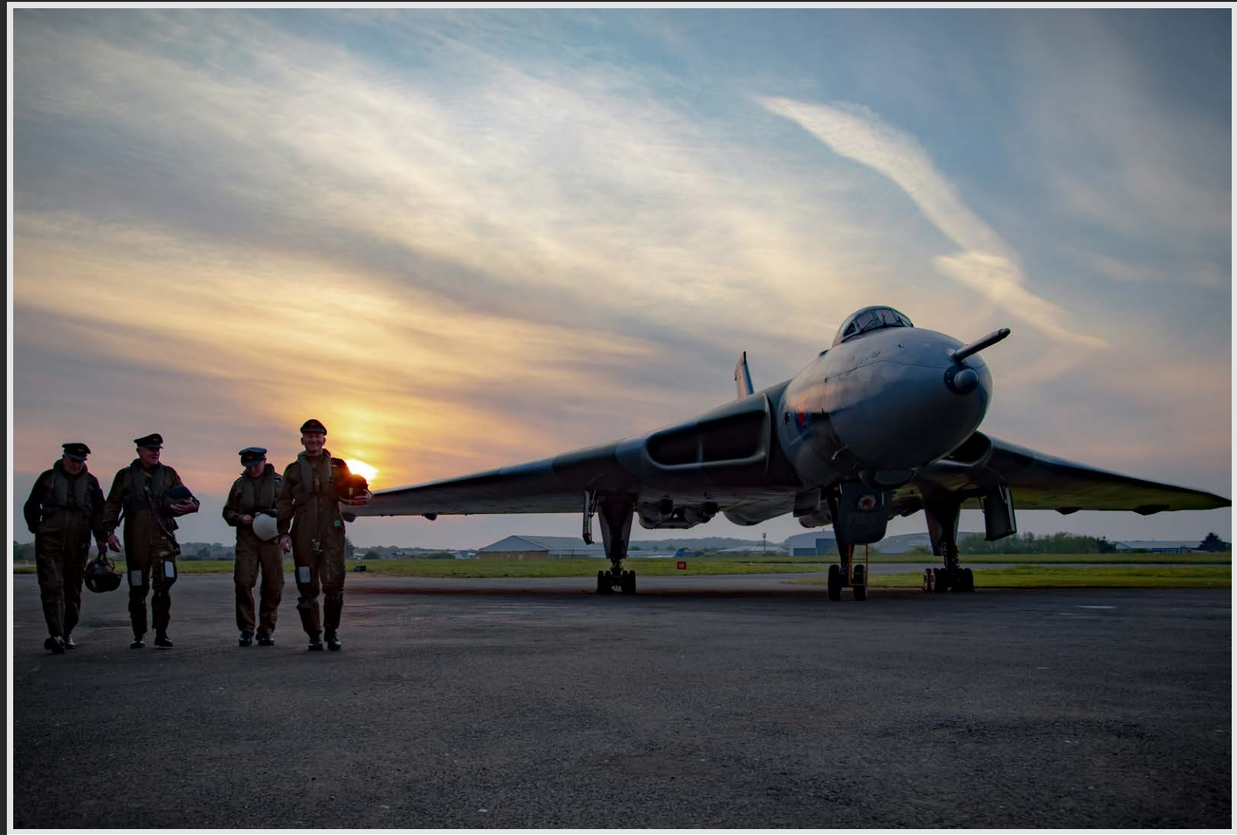
During this well-organized event, about sixty photographers had the opportunity to photograph the Avro Vulcan XL426 in the presence of several reenactors. As a bonus, the photographers were also able to witness an engine run and taxi run of the Vulcan at the start of the event.

We thank the reenactors and the professional guidance led by Steven Comber (COAP) and Emily Mudie (Timeline Events). This was an unforgettable evening where the photographers were taken back to the time of the Cold War and the Falklands War.

The photographers were treated with the Vulcan performing a taxi-run at the beginning of the event.


**Technical Data Vulcan B Mk.2**

| | |
|---|---|
| First flight: | September 1958 |
| Wing span: | 111 ft 0 in (33.83 m) |
| Length: | 99 ft 11 in (30.45 m) |
| Height: | 27 ft 2 in (8.28 m) |
| Max t/o weight: | 250,000 lb (113,398 kg) |
| Max weaponsload: | 47,300 lb (21,454 kg) |
| Speed: | 560 kts (1,037 km/) |
| Range unrefueled: | 4,000 nm (7,408 km) |



From a standing start, the Vulcan is airborne after reaching a speed of 156 kts (289 km/h) within 23 seconds and a take-off run of 3,500 ft (1,067 m). The aircraft is at an altitude of 5,000 ft (1,524 m) is one minute after releasing the brakes for take-off and nine minutes later the Vulcan passes the 40,000 (12,192 m) mark.


VULCAN
TO THE SKY TRUST

# NORTH MACEDONINAN AIR FORCE AT 30

**TEXT:** IGOR BOZINOVSKY | **PHOTOS:** DRAGAN CVETIC

The Macedonia Air Force marked its 30th anniversary on 9 June with a modest celebration held at "Strasho Pindjur" military barracks at Petrovec AB, some 17 km south-east of the capital Skopje.

The celebration saw a flying program that involved fly-pasts of three aircraft: A Mi-17 transport helicopter, a Bell 206B-3 training helicopter, and a Zlin 242L fixed-wing piston engine trainer. The celebration was enriched by a fly-past of a pair of Hellenic Air Force F-16 Fighting Falcon jets of the Araxos-based 335th Squadron *Tigers*: the AIM-9L-armed single-seat F-16C Block 52+ and a twin-seat F-16D Block 52+.

The static display showed an immaculately-looking Mi-24V, Mi-17, Bell 206B-3, and Zlin 242L.

Established on paper on 10 April 1992, the Macedonian Air Force celebrates 10 June as the Air Force Day (Den na voenoto vozduhoplovstvo) to mark the first flight of Macedonian military aircraft on 10 June 1992 when Maj. Dane Ilijevski and Cap. Aleksandar Manev took off from Patrovec AB with an Utva 75A-21 piston-engine, twin-seat basic training and utility aircraft for what is now celebrated as the first historic military flight for Macedonia.

Being a member of NATO, Macedonia plans to invest significant funds in the rejuvenation of its helicopter fleet in addition to building air surveillance and modernizing its air defense capacities. The Russian invasion of Ukraine certainly tends to speed up these processes which are yet to result in withdrawal from the use of the Mi-24V helicopters, a fate that is also expected for the aged and logistically increasingly demanding Mi-8MT/17 fleet.

The replacement for the Soviet-era workhorses would very likely be brand-new helicopters produced by the Western manufacturers. Listed here per alphabetical order are potentially interesting products they may be offered to Macedonia: Airbus (H145M and H215M), Bell (Bell 407M and Bell 412M), Leonardo (AW169M, AW139M and AW149), Lockheed Martin/Sikorsky/PZL-Mielec (UH-60M or S-70i), and MD Helicopters (MD530F).

North Macedonia currently operates a total of four Mi-17 - two with the Air Force and two the Police Aviation Unit.

▲ Mi-24V *Hind*. All four operational *Hind*s formerly served with the Ukrainian Air Force ▲
▼ Bell 206B-3 *JetRanger* Zlin Z242L ▼




Fly-by of a two-seater F-16D Block 52+ and a single-seat F-16C Block 52+ of the Hellenic Air Force 355 Squadron at Araxos AB.

# LIGHTNINGS IN NORTH MACEDONIA

**TEXT:** IGOR BOZINOVSKY | **PHOTOS:** DRAGAN CVETIC

On 17 June, history was written for North Macedonia, the newest NATO member state, when the Lockheed Martin F-35A *Lightning II* landed for the first time at Petrovec AB, near the country's capital Skopje.

A pair of U.S. Air Force (USAF) F-35As belonging to the 134th Fighter Squadron (134 FS) landed on Macedonian soil as part of the campaign to demonstrate the strong alliance and unity among NATO nations and the unbreakable transatlantic link that underpins Euro-Atlantic security. The more immediate purpose of the event was to underline the almost three-decade partnership between the Macedonian Army and the Vermont National Guard, and the readiness of the Alliance to protect the security of its member states.

The 134 FS *Green Mountain Boys* is a unit of the Vermont Air National Guard (VT ANG) 158th Fighter Wing, located at Burlington Air National Guard Base. From 1986 to 2019, the squadron was equipped with the Lockheed Martin Block 30 F-16C/D *Fighting Falcon* jets, the last of which departed Burlington on 6 April 2019 in preparation for the succeeding F-35As. The first two *Lightning II*s arrived at Burlington on 19 September 2019, followed by three more aircraft on 5 December 2019. The last of 20 F-35As was delivered to the *Green Mountain Boys* in October 2020. The 134 FS is tasked to perform Suppression of Enemy Air Defenses (SEAD) missions.

The F-35As (tail code VT) departed the U.S. towards Spangdahlem Air Base, Germany, on 2 May to continue NATO's Enhanced Air Policing mission along the Eastern flank. A day before arriving at Petrovec AB, two other 134 FS *Lightning II*s, temporarily based in Bulgaria, and one Boeing KC-135 *Stratotanker*, assigned to the 92nd Air Refueling Wing, operating out of Spangdahlem, conducted low fly-overs over the Baltic Sea nations of Estonia, Latvia, and Lithuania.

Previously, on 24 February 2022, the USAF F-35A was seen in Romania. On 6 April, four F-35As of the Royal Netherlands Air Force arrived in Bulgaria to support their air-policing amid the Russian invasion of Ukraine. The Dutch fighter jets, along with Bulgarian MiG-29s, protected the airspace of the Black Sea country until 31 May, as part of NATO's integrated plan for air and anti-missile defense. On 1 June, the Vermont F-35As flew a long-range mission to the Bulgarian Graf Ignatievo AB in support of NATO vigilance activities on the Eastern flank.

The first ever F-35A *Lightning II*s in North Macedonia parked on the ramp at Petrovec AB.


For air-policing, the F-35A is armed with AIM-120 AMRAAM air-to-air missiles.


As of June 2022, over 800 F-35s have been produced at Fort Worth, Texas. Until 2044, the U.S. will be the biggest F-35 operator with plans to buy a total of 2,455 aircraft – 1,762 F-35As and 693 F-35B/Cs. These will represent the majority of the U.S. manned tactical airpower for several decades.

The other users or yet-to-become-users are the

- Australia – committed to 100 F-35As
- Belgium – 34 F-35As
- Denmark – confirmed plans to procure 27 F-35As
- Germany – 35 F-35As
- Israel – a total of 50 F-35As are expected to be delivered to the Israeli Air Force
- Italy – 60 F-35As and 30 F-35Bs
- Japan – 105 F-35As and 42 F-35Bs
- Norway – funded the procurement of 40 of 52 F-35s, with subsequent authorization an annual basis
- Poland – 32 F-35As
- The Republic of Korea – to date, 13 F-35As delivered out of 40 ordered
- Singapore – set to purchase four F-35Bs with the option of an additional eight
- Switzerland – 36 F-35As
- The Netherlands – 46 aircraft ordered
- United Kingdom – up to 138 Lightning II, 48 of those by 2025
- Almost certain future operators of the F-35 are Greece (20 aircraft with 20 more as an option for USD 3.7 billion including weapons, simulator, training, and logistics) and Romania (up to 3 squadrons to replace its F-16s after 2035-2040).

The F-35A is projected to stay operational until 2070.

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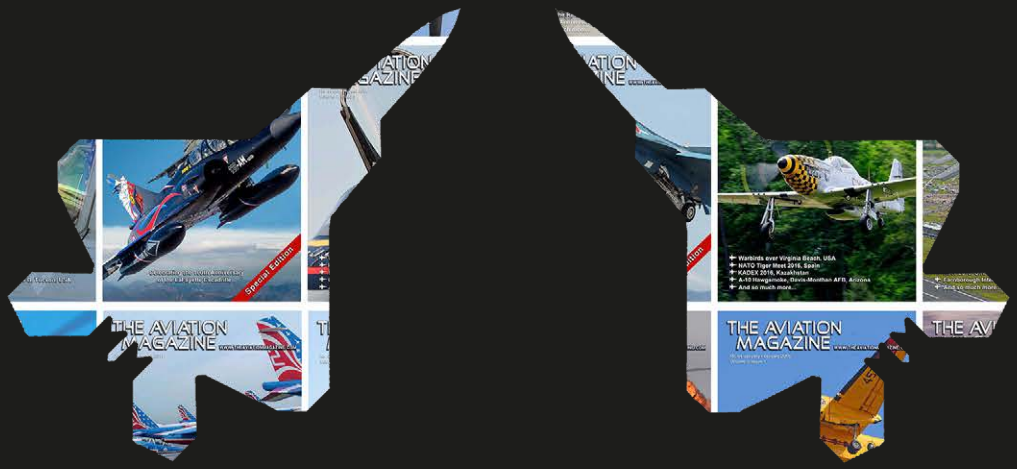


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