THE AVIATION MAGAZINE

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Volume 13, Issue 5

- The Eagles of Mar Menor
- Sentry Eagle
- Ukrainian Fencers
- Anniversaries over Florennes
- And so much more ...

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Content

Cover: Refueling of an U.S. Oregon Air Nationational Guard F-15C *Eagle* assigned to 173rd Fighter Wing at Kingeley Field ANGB during Exercise SENTRY EAGLE 2022. ***Photo Mathias Leischner***

This page: A-10C *Thunderbolt II* of the A-10C Demonstration Team of the 354th Fighter Squadron at Davis-Monthan AFB performing a low pass at the SENTRY EAGE open House in June 2022. ***Photo Ralf Peter Walter***

THE AVIATION MAGAZINE

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

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,

In this 80th issue of issue of THE AVIATION MAGAZINE, we take you up to the skies over Oregon and Belgium. In June, we were invited by the U.S. Oregon Air National Guard on an air refueling mission during this year's edition of the exercise Sentry Eagle at Kingsley Field. It was a unique experience to be on-board of an KC-135 refueling the iconic F-15C *Eagle*. Over Belgium, we had a one of kind opportunity to photograph two F-16s with special anniversary color schemes from the opened rear cargo ramp door that provided stunning air-to-air photos.

Also on the ground, there were many exciting activities: airshows, such as the well-known NATO Days at Ostrava AB in the Czech Republic or the seaplane meeting at Biscarosse in France; an aeromedical exercise in the Netherlands as well as flight operations from a dust airstrip in Spain; two reports cover the from Cyprus military and police aviation, and more. The current conflict in Ukraine has prompted us to bring a extended photo report about the Ukrainian Su24 *Fencer* before the war.

We are very excited that we have once again been able to put together a comprehensive and exciting issue of THE AVIATION MAGAZINE, which you can download free of charge **here**.

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

Ralf Peter WALTER
Publisher & Editor

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THE EAGLES OF MAR MENOR PART 1

ARTICLE BY MARCO MUNTZ
AND WIEBE KARSTEN

The Academia General del Aire (AGA) at San Javier stands at the cradle for future pilots of the Ejército del Aire or Spanish Air Force. Located in the Region of Murcia on the shores of both the Mediterranean Sea and Mar Menor lagoon, San Javier Air Base is blessed with nice weather almost all year round, making it a perfect place for flight training. For years, the skies over San Javier were dominated by the ENAER T-35 and CASA C-101, but this is about to change with the arrival of the Pilatus PC-21 as the new basic training platform from the next academic year. By then, the C-101s will no longer be used to train students, but will be exclusively flown by the Patrulla Águila display team for a few more years.

A flamboyant history

For strategic reasons, mainly to defend the Cartagena naval port, the Spanish Navy decided to establish a new naval airbase along the coast of Mar Menor. Construction to build the airport infrastructure at San Javier started in 1928, and many of these buildings and hangars are still present today. When the base opened in early 1932, the Escuela de la Aeronáutica Naval was relocated here from El Prat, Barcelona. The National Uprising against the Republican Government, which started in July 1936, put Spain in a civil war lasting nearly four years. After the victory of the Nationalists in March 1939, the Spanish armed forces were reorganized. The Aeronáutica Naval was absorbed into the newly created Ejército del Aire and former naval base San Javier was appointed by the Ministerio del Aire to become a dedicated flight training base. By Decree of 28 July 1943, the Academia General del Aire was founded to train all future officers in the Ejército del Aire. Two years later, in September 1945, the very first academic officer course started, the 1ª Promoción. The Bücker Bü 131 *Jungmann* biplane, Spanish designation E.3 (E – entrenamiento or training) became the main aircraft in use for elementary training from 1945. The E.3 was superseded by the E.3B, a Bü 131 variant with a stronger engine constructed by Construcciones Aeronáuticas S.A. (CASA) and designated CASA 1131. For basic training, the Academia received the first batch of brand-new Hispano Suiza HS-42 trainers (E.6) in 1946, the type remained in service until 1955. Starting in 1946, officers were also trained in the skills of navigation, surveillance, and aerial reconnaissance and for these purposes, a mix of Savoia Marchetti SM-81 (T.1), Junkers W-34 (L.14), and Junkers Ju-52 (T.2) aircraft were used. The W-34 and SM-81 were already retired in 1948 and 1949 respectively, while the Ju 52 was soon replaced by the CASA 352L (T.2B), a slightly improved version of the Junkers 52. The C.352Ls at San Javier were supplemented by the CASA 2111, the license-built Heinkel He-111 (B.21), for bombing practice from 1953 until 1964. The signature of a defense treaty between the United States and the Spanish government in September 1953 also had a

A CASA C-101EB is about to leave the main ramp at San Javier Air Base, home to the Academia General del Aire (AGA). The flight line visible in the background is composed of a mix aircraft of 741 Escuadrón, 793 Ecuadrón and Patrulla Águila Aviojets.

positive impact on the training fleet of the Ejército del Aire. In exchange for the rights to use certain Spanish bases by the USAF, the United States would supply modern aircraft, spares, training, and support for the local aviation industry. From February 1958, a total of 26 Beechcraft T-34A *Mentor*s (E.17) started to equip the newly established Escuadrón de Vuelo Básico at San Javier. Also, the Spanish-developed AISA I-115 (E.9) was inducted into service by the Academia in 1958, intended to complement and ultimately, replace the CASA 1131. However, the I-115 was considered to be inadequate as an elementary trainer and eventually, became a navigation and reconnaissance training platform. North American T-6 *Texans* arrived at San Javier from 1962 and approximately 30 aircraft were assigned to the 3rd Escuadrón de Vuelo de la Academia to provide the basic flight training course. In 1966, all *Texans* were relocated to Salamanca-Matacán to equip the Escuela Básica de pilotos. The air wing attached to the Academia at San Javier, Grupo 79, became primarily responsible for elementary (advanced) and crew (navigation) training. All CASA 1131s and T-34As were allocated to 791 Escuadrón while 792 Escuadrón operated the remaining CASA 352s and I-115s. In April 1972, the Escuela Básica closed down and the *Texans* were transferred back to San Javier to equip the newly established 793 Escuadrón. The fleet of Hispano Aviación HA-200A Saeta's (E.14A) operated by the Escuela Básica also made the move from Matacán to San Javier and joined 793 Escuadrón in July 1972. These E.14As were supplemented by a batch of HA-200D Saeta's (C.10B) in April 1974. The final CASA 352s had been retired by 1973 and replaced by DC-3 Dakota's (T.3). Nine Dakota's in total made their way to 792 Escuadrón between 1972 and 1976. However, all had been transferred to other units by 1978, leaving their navigation training task with the CASA C-212 (TE.12) which entered service in 1974. The CASA 1131 served the Academia well. The last of these biplanes were withdrawn in March 1976, while the final twelve AISA I-115s were retired one year later. Both types had been gradually replaced by a fleet of thirty Beechcraft F.33Cs (E.24), the Bonanzas were integrated into 791 Escuadrón from November 1974 and delivered in two batches of 12 and 18 aircraft respectively. In March 1980, the first four CASA C-101EB (E.25) *Aviojets* arrived at San Javier to re-equip 793 Escuadrón. The initial batch consisted of thirty C-101s, followed by an additional ten aircraft. The new C-101 initially replaced the remaining E.14A Saeta's, which all had been relocated by the end of

Top: Two ENAER T-35C *Pilláns* are seen parked on San Javier's ramp in between training flights. All T-35s are assigned to 791 Escuadrón to provide the elementary training phase at the Academia General del Aire.

Bottom: Most AGA students get their first ever flight experience on the T-35. They will start flying in their third academic year, accumulating 48 flight hours on that type, before advancing to the basic training phase.

March 1980, while in June 1982, the last T-6G Texans were retired after the academic year. In June 1985, the Patrulla Acrobática Águila or Aguila display team was established at San Javier. The name refers to the eagle depicted in the crest of the Academia General del Aire to honor the academy's traditions. Also 791 Escuadrón saw some big changes during the eighties. About two-thirds of the F.33C fleet was transferred to Grupo 42 at Madrid-Getafe between 1981 and 1984. In September 1987, deliveries of the ENAER T-35C Pillán commenced to re-equip 791 Escuadrón. In total, 41 T-35Cs or E.26 were constructed by CASA under license to replace the veteran T-34C *Mentor*. After 30 years of service, the Mentor was finally released from training duties at the end of 1988 and put into storage at Albacete. The first student course on the E.26 started in September 1988 but after just one year the fleet of T-35s was already grounded after a fatal crash caused by an engine failure. Inspections revealed technical shortcomings and after a thorough revision and all necessary modifications, the E.26 was released back to service in September 1991. During these two years, the Beech Bonanza was mainly used for elementary training. The last F.33Cs left the Academia in 1994 to be incorporated in Grupo 42 at Getafe. From June 1991, the CASA 101s assigned to Patrulla Águila appeared in a remarkable silver, yellow and red livery based on the F-86F *Sabre* paint scheme of the former Ascuas (Arrowheads) display team and were equipped with a smoke generator. The following year, in October 1992, ten C-101EBs were drawn from 793 Escuadrón to re-equip 211 Escuadrón at Moron, together with eight aircraft from Matacán-based 744 Escuadrón. The latter unit received all eighteen C-101s in 1996 when 211 Escuadrón converted to the F/A-18A. Ever since several C-101s from Matacán are being deployed to San Javier to have enough aircraft available for training. In 2003, the air navigation school closed down and the remaining three CASA C-212s were withdrawn by 792 Escuadrón. This unit was revitalized as transition squadron for the new Pilatus PC-21 (E.27) ordered in January 2020 to replace the aging fleet of C-101EBs. On 11 May 2018, the Academia General del Aire celebrated its 75thAnniversary. At the time, the school had accumulated over 935,000 flight hours on 21 different aircraft models since the establishment of the Academia General del Aire at San Javier in 1943.

University Degree

All students who aspire to a future career as a military pilot in the Spanish Air Force are subject to a university entrance exam and a selection process before admission to the Academia General del Aire (AGA) at San Javier. The academic education and flight training last five years and after graduation students leave the AGA as a second lieutenant with a bachelor's degree in engineering. The first two years at the Academia are purely theoretical in which students receive military training, lecturers on aeronautical subjects, and study civil engineering at the Centro Universitario de la Defensa (CUD) in San Javier. In the third academic year, students start their flight training, Phase I, although, half of the year is still related to theoretical classes. The fourth and fifth years are mainly dedicated to flying. Phase II entails the basic flight training course during the fourth year, while the final academic year includes Phase III and Phase IV when students will be trained depending on their future assignment as either a fighter, transport, helicopter, or drone pilot.

Top left: A T-35C *Pillán* taxies out for another flight in one of the training areas surrounding San Javier AB. The propeller-driven trainer is characterized by its spacious cockpit providing an optimal view for both student and instructor pilot. Clearly visible is the Cabezo Gordo Rock Formation which consists of marble structures rising up to 312 meters.

Bottom left: Returning to its parking spot after completion of a flight, this T-35C nicely shows its conventional design developed in the late seventies. The *Pillán* is driven by the Lycoming IO-540-K1K5 six-cylinder piston engine delivering 300 horsepower.

Right: Using the *Pillán*'s horizontal stabilizer to put down some of its flight gear, a student gets organized after having just stepped out of the cockpit.

The AGA has set some requirements which need to be achieved during the fifth year including tactical and operational elements. The students finish their academic studies by writing a paper on a chosen subject of engineering to graduate from the Academia General del Aire and start their conversion training in one of the operational squadrons.

Elementary flight training

Elementary flight training, Phase I, is being given on the propeller-driven ENAER T-35C *Pillán* which has been flying in Spain for almost four decades. Nowadays, 791 Escuadrón operates around 35 T-35Cs to provide Phase I training. The current commander of 791 Escuadrón, Major Ferrer, explains: "Students start to fly in their third academic year which is a selective training period. We have an average of 60 students annually, this year (2021-2022 course) 64. Due to the number of students, we had to split this group, one course runs from September to January followed by the next one from late January until June. They fly 48 hours in total on the *Pillán* completing 37 missions to cover four stages: accommodation to the aircraft, transition, aerobatics, and formation flying. The elementary course on the *Pillán* lasts four to five months, depending on the weather as the course is entirely under Visual Flight Rules (VFR). The first three weeks will be spent in classrooms to learn all about the aircraft and procedures. To pass the theoretical exams, a minimum grade of 70% is required on aircraft general knowledge and local procedures while a 100% score must be achieved for aircraft limitations and emergency procedures. Only after having passed all four exams, the student will start flying the *Pillán*. Due to the lack of any flight simulator, students need to study the exercises from training manuals and cockpit layout diagrams to prepare for flight. They will also frequently sit in the real cockpit on the ground with an instructor to train procedures or simulate exercises, the so-called 'dry flight'. A general briefing is held before a flying day where subjects like meteo and VFR procedures are addressed to increase their basic knowledge. The student has to be able to fly solo on the 17th flight, in a total of 20 flight hours. This is the selective phase, if they don't get to that point, they will have to stop flying. The average drop-out is 10% which means between four to six students will not pass the annual course." The flight prior to the first solo flight is the student's initial check ride. The next check will be given on the 26th flight which is the end of the transition phase

In total, 41 T-35C *Pillán*'s were built under license by CASA at their Getafe factory near Madrid. Due to the loss of one T-35 before delivery, 40 aircraft made their way to the AGA in the end. About 35 *Pilláns* are still in service to serve as elementary training platform.

covering both the selective and aerobatic phases. Only after having passed this test, the student continues and learns to fly in formation. During the course, the student will fly solo only three times, flight detail 17, 22, and 36. During the first solo flight, the student remains in the traffic pattern while on the second one, aerobatic maneuvers will be practiced in one of the training areas close to San Javier. The final solo flight, which is the 10th formation flight, is flown with a second aircraft to practice basic formation maneuvers with an instructor. The 11th formation flight is the student's final check on the T-35. One of the main difficulties students are facing during the elementary course, especially in the beginning, is finding the right way to prepare for a flight. Major Ferrer explains: "Generally speaking, students know how to study for a written test but don't know how to study for a flight; that is different. They have to imagine they are flying and apply the applicable procedures and flight techniques, something they have not done before. When students start flying, they don't get the same grades as they are used to which could lead to frustration. Sometimes, students have problems managing that. It is a learning process." According to Major Ferrer, the T-35 is relatively easy to fly. "Students have to get familiar with the single piston propeller which requires a lot of feet input, especially during certain aerobatic maneuvers with changing speeds such as a looping. They have to learn to apply the rudder. We say 'if you can fly the *Pillán*, you will be able to fly anything'. For students, the training course on the Pillán is a demanding period as for most of them, it is the first time flying an aircraft. There is a lot of tension as they have to achieve certain goals in a short period in an environment they are unfamiliar with. Students have to learn to deal with pressure, frustration, high standards, and all stress involved which they can apply to other platforms and jobs in the future. However, the main point is that a student has to fly solo in 17 flights, not a single flight more. Those who are unable will be re-trained as an air traffic controller. Students who achieve this requirement have a good possibility to pass the whole course and will be well prepared to go to the next aircraft."

Basic training course

For than three decades, students have been transferring from the T-35 to the C-101 for their basic training course. However, after the 2021-22 academic year, the C-101 will be retired, almost forty years after the start of the very first student course on type in September 1982. Students who are currently in their fourth year are the last ones to conduct Phase II training on the CASA C-101EB or E.25 Mirlo. On average, between 55 to 60 students are being trained in the fourth year. The major difference with the elementary course is that the basic training course takes the whole year, from early September until the end of June. Students fly 63 missions on the C-101, during which they accumulate 84 flight hours. After the students have passed their theoretical exam and a minimum of two flight simulator sessions, the actual flying commences. The initial part of the flight training course is the transition phase which consists of 26 flights, the same number as in 'elementary school'

Top: The CASA C-101 flight line pictured at San Javier in October 2021, dominated by Patrulla Águila aircraft. Now the final academic class has finished the basic flight training course, the remaining CASAs with sufficient flight hours left, will be assigned to the aerobatic display team.

Bottom left: A ground crew member has just marshalled the C-101 into its parking position and gives the signal to the student pilot to stop the aircraft, followed by setting the parking brake and shutting down its engine.

Bottom center: While the front step ladder is about to be attached, the instructor pilot is carefully getting out of the rear cockpit. This is now a scene from the past as no more students are being trained on the C-101.

Bottom right: With a lot of passion, display and instructor pilot 'Águila 2', talks to his student on the way to the debriefing room after having just returned from an early morning flight.

The shape of the classic C-101 is nicely shown as the sun sets behind the aircraft. After forty years of training future Spanish Air Force pilots, the *Mirlo* is now in the twilight of its career.

which includes aircraft handling, emergencies, and aerobatics. After having successfully finished their transition, students enter the common phase starting with formation flying. This phase entails 20 flights including eight missions with two aircraft and two missions with three aircraft. The common phase progresses with flight instrument training (IFR) which is completely new to them as all previous flights were flown visually (VFR). During 24 flights, students learn to navigate and fly approaches purely on instruments, both at San Javier and other airfields across Spain. Three night flights will be conducted in total, one VFR and two IFR flights. For instructor pilots, these night training flights are rather challenging as Major Zambrano Duque, commander of 793 Escuadrón, points out: "The vision we have from the rear cockpit is really poor. At night, it is really difficult to land the aircraft as there is no head-up display or something similar to assist us. We have to judge the height from the side of the front seat." The use of the simulator is an important part of the training and flight preparation for the C-101 students, especially emergency training and instrument flying. In total, 42 simulator sessions are scheduled for each student throughout the year, however, the majority of simulator training is provided during the transition phase. Ideally, the simulator will be used ahead of a specific flight detail. Due to the large group of students and the availability of only two simulators, both devices run the whole day and sometimes even on Saturdays. Although the basic course is quite demanding, the number of students who don't pass is rather small. "We have a drop out in the 4th year of 5% approximately, they don't meet the requirement of the solo flight on their 16th flight," says Major Zambrano Duque. "I have 55 students this year, which means two to three will not be able to finish the training syllabus. The dropout is usually not caused by the inability to fly but by other reasons such as medical issues or spatial disorientation. The main difference here is if they do not achieve the solo requirement, they can continue as a drone pilot instead of air traffic controller when students drop out in the elementary phase." The few students who continue their training as future MQ-9A Reaper pilot will occupy the back seat of the C-101 for approximately 40 flights to cover specific subjects such as procedures, instrumental flight, and radiotelephony communications but no more take-off or landings. All 63 flights of the basic training course will be graded, each flight has a grade from 1 to 10. At the end, the average grade of the whole course is taken into consideration and those students with a grade of 7.75 or higher are likely to be selected to be trained as a fighter pilot. They conduct an additional 12 flights in preparation for the advanced phase such as low-level and advanced formation flying. "The students will get some theoretical classes on low-level flights and how to prepare an attack, taught by experienced instructors who have flown these kinds of missions on the Hornet or Eurofighter", Major Zambrano Duque explains. "None of these missions are graded, it is more like a demo phase to show the student what they are going to face during the advanced course which is very useful to them. In the third year, our main job is to select who can be a pilot or not. In the fourth year, our main task is to select who is going to be flying fighters, transport planes, helicopters or drones." In the fifth year, students who will be trained as fighter pilots move to Talavera-La Real for the advanced training course on the SF-5M. However, the ones with the best English language level will join the Euro-NATO Joint Jet Training program (ENJJPT) at Sheppard Air Force Base in the United States flying the T-38C. The GRUEMA at Salamanca-Matacán provides training for future transport pilots on the CN235M. Also, the UAS Military School is present at Matacán. Students who are appointed to fly helicopters continue their training at Granada-Armilla on the EC120B. After graduation from the Academia General del Aire, the students will transfer to an operational squadron for specific on-type training. Students with the highest overall grade have the best papers to get appointed to their aircraft type and squadron of preference, subject to operational needs.

Top: Two CASA C-101EB's are about to start up for another training flight.

Bottom: All Patrulla Águila pilots were instructors as well on days when the team was not preparing for the new display season. However, neither of them will make the transfer to the PC-21 and will be fully dedicated to the aerobatic team instead.

Flying the *Mirlo*

One One of the 55 students who is currently being trained on the C-101 is Fernando Lopez Aguado. "With only experience on the propeller-driven T-35, the transfer to the C-101 is a rather big step", cadet Aguado recalls: "In the beginning, it was very difficult because you almost fly twice the speed of the Pillán. In the 'CASA', everything goes faster. You have to be more focused on what you are doing. The plane is more complex, you have to deal with new equipment, more switches, and buttons. But once you are used to that, flying becomes really enjoyable. The aircraft is relatively easy to fly. It behaves well and is very responsive to control inputs, in short, a perfect plane for students." The handling of emergencies is an important part of the training syllabus. Cadet Aguado continues: "In the initial part of the transition phase, I had to deal with

The semi-arid climate of Mar Menor is well-illustrated by the palm trees in the background as a Patrulla Águila C-101EB is about to cross the threshold of Runway 05.

emergencies almost every flight. Emergencies were either simulated in flight or I had to verbalize how I would resolve the problem. Engine failures are probably the most challenging because once you run out of thrust, you have to glide. However, this plane glides very well. Every thousand feet, you can glide for two miles. You constantly have to calculate the distance to the airfield and the required height to land. When flying aerobatics, it is easier to adapt to the 'CASA' compared to the *Pillán*. The maneuvers and sequences are exactly the same, except for throttle inputs as the 'CASA' is more powerful. Every time we start a maneuver, we check all parameters to make sure it will be safe and not flying out of the training sector. Otherwise, we abort and start again or fly in a different direction. We use cities or specific landmarks as a reference to stay within the boundaries of the sector in addition to navigation instruments. The C-101 is really iconic for us, it is a plane that has been here for 40 years. I think I am really lucky to be one of the last students to fly this airplane." Major Velasco, an experienced instructor pilot on both the C-101 and T-38C, notices certain tendencies among new C-101 students: "Initially, they need time to get comfortable with the new environment. Sometimes, students get claustrophobic when wearing both their G-suit and oxygen mask. Also, disorientation might arise during IFR training when a student controls the aircraft from a fully blinded rear cockpit navigating on analog instruments only. To just rely on conventional instruments without having any navigation display available turns out to be quite a challenge for some students to master the C-101 in IFR conditions. The flight simulator is a very valuable tool we have to teach the students the use of flight instruments and emergency procedures." Depending on either the number of students or instructors, two to three students are assigned to one instructor pilot who acts as a mentor. Major Velasco continues: "We intend to let the student fly with the same instructor as much as possible throughout the course. The main reason behind this philosophy is to create a high level of stability and consistency for the student. However, during simulator training, this concept is dropped when the student can be taught by any instructor. As this approach has proven its value, we will use

it on the PC-21 as well. The beginning of the basic course flying with students new to the C-101 is quite a demanding period for us as instructors. However, it is a 'forgiving aircraft' which means that there are fewer surprises for student pilots during their flights." An instructor meeting is held on a daily basis to

Top left: Another Patrulla Águila jet is taxiing out at the start of a training flight from San Javier.

Center: Águila 1, the leader of the display team, wears a stylish helmet with his visor down facing the early morning sun.

Top right: The silver, yellow and red color scheme of the Patrulla Águila C-101s introduced in 1991 is based on the F-86F *Sabre* livery of the former Ascuas (Arrowheads) display team.

Center and bottom right: Two different angles of the same Aviojet, serial E.25-88 (74-39), which is the last of in total 88 C-101EBs constructed by CASA for the Spanish Air Force.

review the training flights of that day and talk about particular issues that came to light. Major Velasco points out: "A common error on the C-101 is a wrong flap setting by students who are getting nervous when practicing formation landings. The students of this year's basic course have a higher than the normal number of gear overspeed events, a subject which is likely to get more attention when the next class commences flying. All in all, the C-101 allows them to learn basic flight maneuvers very properly, something that benefits them throughout their career as military pilot."

The twilight years

The C-101 is now clearly showing its age. Due to the limited number of available C-101s, only between 15 to 18 sorties are being flown each day instead of the 24 scheduled. A major issue is the lack of spare parts causing serviceability problems in the C-101 fleet. Replacement parts are usually related to mechanical systems, such as landing gear brake discs, as the C-101 is not equipped with any computer except for the fuel supply metering system. The initial plan was to have the C-101 retired by September 2021 but due to the COVID-19 pandemic, the PC-21 delivery schedule was delayed by one year. Once the PC-21 has been inducted into service, 30 sorties a day are anticipated. In April, the first two C-101 instructors started their Pilatus conversion course run by 792 Escuadrón. Still, 20 pilots are instructing on the C-101 including five foreign instructors; three Argentinean, one American, and one Italian pilot, as part of an exchange program, lasting three years but only two of them will be trained on the PC-21. Amongst the current C-101 instructors are also all seven Patrulla Águila display pilots. Until their preparation for next year's season, which started in February, the Aguila pilots were fully available as instructors. However, neither of them will make the transition to the PC-21. Instead, they will be fully committed to the display team. The Patrulla Águila display team usually rehearses twice per week, on Tuesday and Thursday afternoons. On these days, the team's pilots do not fly with students ahead of their own training flight. Although most technicians will make the change to the PC-21, a small group will be retained on the C-101 to support Patrulla Águila."All training flights included, we expect the team not to fly more than 2,000 hours per year. Right now, training student pilots, we accumulate over 6.000 hours on the C-101. As more aircraft approach the limit of airframe hours, set at 6.600, we are going to have fewer aircraft every year. All C-101s with sufficient flight hours left will therefore be assigned to Patrulla Águila. With a requirement of 2,000 hours annually, we should have the C-101 flying for another 6 to 10 years", says Major Zambrano Duque, former leader of Patrulla Águila. "Hopefully by then, the team will fly with a Spanish-built jet trainer to demonstrate the abilities of our national aviation industry to the public."

Coping with busy airspace

In January 2019, San Javier became a full military airport as it closed for all civil traffic which transferred to a new airport located 18 miles west of San Javier, Aeropuerto de la Región Murcia, also known as Corvera airport. This move enabled an increase in training flights as airliner movements no longer caused delays while the risk of an airborne conflict was reduced enhancing overall safety. However, the military approach control at San Javier still deals with all civil aircraft flying into Murcia airport to separate these from military flights. Major Zambrano Duque: "Although we still have to take these civil movements into account in our daily operations, we had more problems when they were still flying into San Javier. Our operations needed to be stopped frequently to let the airliners go in and out of the airport which was much worse." The Academia General del Aire has a vast training area at its disposal between 15 and 65 nautical miles west of San Javier. This restricted area (LER 63), reaches up to 26,000 feet and is divided into multiple sectors. In order to keep adequate vertical spacing, all T-35 flights are conducted between 2,000 and 8,000 feet while the C-101 pilots have to keep 10,000 feet as a lower limit. San Javier AB has two parallel runways available in the southwest/northeast direction. The main runway (05R/23L) has a length of 2,300 meters equipped with an ILS approach system on both runway ends and is predominantly used by the C-101. The VOR/DME beacon at the airport provides instrument approaches for each runway direction. This navigation aid also helps to determine the boundaries of the various training areas in flight. The secondary runway (05L/23R) is almost 1,700 meters in length and is exclusively used by the T-35. To separate the much slower T-35 from the C-101, the T-35 traffic pattern runs north of the airbase while the C-101s fly their circuit south of the field over the Mar Menor lagoon. Due to Air Traffic Control (ATC) limitations, a maximum of four aircraft are allowed into the traffic pattern. If a diversion is required, Albacete AB is usually taken as the primary alternate as it is the closest airbase, located 85 nautical miles northwest of San Javier. However, also the civil airports of Murcia, Almeria, and Alicante are well suited for diversion if aircraft are unable to land at San Javier for whatever reason.

Top left: Due to intensive use and decreasing number of serviceable C-101s, 793 Escuadrón of the Academia General del Aire constantly required additional jets from Salamanca based 741 Escuadrón.

Bottom right: Performing touch and go's at San Javier AB, this C-101 is piloted by a student making his first solo flight on this type of aircraft.

A CASA C-101EB is ready for a night flight. With the retirement of 793 Escuadrón's Aviojets and the unknown faith of 741 Esquadrón, only the test unit (CLAEX) and the Patrulla Águila display team will continue to operate the type for a few more years to come.

AeroMedEvac
THE DUTCH WAY

ARTICLE BY CARLO KUIT AND PAUL KIEVIT OF BRONCO AVIATION

While the CH-47D Chinook crew flies patients toward a hospital as quickly as possible, the Aeromedical Evacuation Physician (AEP) and Aeromedical Evacuation Nurse (AEN) do everything they can to keep them alive. The helicopter acts as a flying ambulance in these cases. This is a typical scenario that can occur in a real-life situation during a deployment or as part of an evacuation of military servicemen. The annual held ORAC (Operational Readiness Aeromedevac Course) is preparing participants for these emergency situations.

In July 2021, this two and a half weeks of training were organized in The Netherlands. ORAC is the Initial Rotary Wing Aeromedevac course of the Royal Netherlands Air Force (RNLAF) that is conducted by

the Operational Health Department (Operationele Gezondheidszorg/OGZ). The OGZ is a part of the Center for Men and Aviation (CML). The OGZ consists of soldiers with a (specialist) medical background. One of OGZ's main tasks consists primarily of providing Aeromedical Evacuation (AE) capacity (air transport for casualties). With AE, wounded soldiers and civilians are taken by helicopter to a hospital in the mission area (Forward AE) or flown back to the Netherlands by Airlift (Strategic AE). If many patients have to return to the Netherlands, they can be accommodated in a so-called Casualty Staging Unit (CSU) before the flight. Supporting the ORAC course is 298 Squadron of the Royal Netherlands Air Force/ Defense Helicopter Command (Koninklijke Luchtmacht/ Defensie Helicopter Commando - DHC). 298 Squadron is based at Gilze-Rijen AB and operates the Chinook CH-47Ds and since 2021, the new CH-47F MY CAAS version. "Rotary Aeromedical Evacuation participants start their training on the C-130 Hercules fixed-wing platform", explains Lt Col Johan, Chief Aeromedical Evacuation Medical Director of the RNLAF. "We start the AE training with the support of Austria, the United States, and Canada. We buy training courses from these countries because we have limited availability of our own C-130 Hercules fleet."

The ORAC course is a preparation for obtaining the Rotary Wing Aeromedevac Evacuation (AE) status by the participants. Like in 2020, the course of 2021 was held in The Netherlands as travelling to the US brought big challenges due to the COVID-19 situation. Normally, the course takes place under the supervision of the RNLAF 302 Squadron stationed at Fort Hood (US Army Airbase), Texas.

The training integrates knowledge of aero-medical training, trauma, and other emergency medicine, into a good working concept supported by a helicopter platform. The ORAC course is supported by a highly experienced AE instruction group consisting of Aeromedical Evacuation Physicians (AEP), Aeromedical Evacuation Nurses (AEN), and medical specialists with both military operational (mission

Supporting the ORAC course is 298 Squadron, stationed at Gilze-Rijen AB, of the Royal Netherlands Air Force/Defense Helicopter Command (Koninklijke Luchtmacht/Defensie Helicopter Commando - DHC), operating the Chinook CH-47Ds and lately the new CH-47F MY CAAS version since 2021.

'medical evacuation' (MEDEVAC) and 'casualty evacuation' (CASEVAC)

MEDEVAC – *Medical evacuation is performed by dedicated, medically equipped, and standardized MEDEVAC platforms designed especially for the MEDEVAC mission to provide en route care by trained medical professionals who provide the timely, efficient movement and en route care of the wounded, injured, or ill persons from the battlefield or other locations to MTFs. The provision of en route care on medically equipped vehicles or aircraft greatly enhances the patient's potential for recovery and may reduce long-term disability by maintaining the patient's medical condition in a more stable manner.*

CASEVAC – *A casualty is any person who is lost to the organization through death, wounds, injury, sickness, internment, or capture or through being missing in action. Casualty evacuation is the movement of casualties aboard nonmedical vehicles or aircraft without en route medical care.*

deployments to e.g., Bosnia, Iraq, Afghanistan, Mali) and civilian experience.

Since 2009, the Royal Netherlands Air Force organized the ORAC courses in three different countries; The Netherlands (2017, 2020, and 2021), The United States: Fort Hood, Texas (2018, 2019, and 2022); Salt Lake City, Utah (2015); Fort McCoy/ Volk Field, Wisconsin (2009, 2014, and 2016); and Canada: Petawawa, Ontario (2018).

The 2021 edition was attended by 18 participants. The training consisted of both theory and practical lessons/exercises. Key attention areas are physiology, the stress of flight, and crew resource management principles. The goal for the ORAC participants is to become more familiar with the equipment and materials used in the aeromedical evacuation role which is a vital component to be able to work in this environment.

Captain Gracia was one of the participants of the ORAC 2021 course. It was her first experience flying a helicopter. "There were some moments of stress and also I had to adapt to the flying circumstances

Captain Gracia

like noise, vibration, and tiredness" she explained. The personal goal for Captain Gracia was to participate together with the military flight doctor during the helicopter flights and to learn and adapt to the specific procedures during medevac flights. "You have to be sure that all is secured, and of course, the safety of the patient during the transportation is priority number one. Also, the communication onboard of the Chinook with both the loadmaster and the pilot was a big challenge to me" she continues. "Priority here is to get to the helicopter with the patient in a safe condition as soon as possible. The ORAC course gave us a great inside look and experience of what to expect during a deployment. Next steps will be training, training (including the FAMET - Forward Aero Medical

The ORAC course is a preparation for obtaining the Rotary Wing Aeromedevac Evacuation (AE) status by the participants. Like in the year 2020, the course of 2021 was also held in The Netherlands as travelling to the US brought big challenges due to COVID-19 situation.

NATO Triage Categories

PRIORITY GROUP 1 | Red or Emergency / Immediate

Patients who have life-threatening injuries that are treatable with a minimum amount of time, personnel, and suuplies. These patients have agood chance of recovery.

PRIORITY GROUP 2 | Yellow or Urgent

Indicates that treatments treatment may be delayed for a limited period of time without signifcant mortality or in the ICU setting patients for whom life support may or may not change their outcome given the severity of their illness.

PRIORITY GROUP 3 | Green or Delayed

Patients with minor injuries whose treatment may be delayed untile the patients in the other categories have been dealt with or patients that do not require ICU admission for the provision of life support.

PRIORITY GROUP 4 | Blue or Expectant

Patients who have injuries requiring extensive treatments that exceeds the medical ressources available in the situation or for whom life support is considered futile.

Black or Dead

Patients who are in cardiac arrest and for which resuscitation efforts are not going to be provided.

1 Instructors take a close look at the participants.
2 Vital functions of the patients are checked before getting them ready for further transport.
3 Wounded persons were all over the training grounds, waiting to be helped.
4 One of the patients is being mobilized for the helicopter flight back to Gilze-Rijen AB.

Evacuation Training Course), and being ready to be deployed in the near future".

Sergeant Major Chris was one of the instructors and course managers of the ORAC 2021 course. The course manager coordinates all substantive matters during the course. "My satisfaction is to witness the personal evolution of the participants during the course. Their emotions go from 100% concentration and tension to a big relief at the end of the flight. ORAC is a short and intense period of intensive cooperation. Participants often meet their personal boundaries; it is our job to lead them in the right direction. My main goal is to convey my experience and the lessons learned to the participants. This should result in having everyone participating during the course prepared for the complex tasks. Unfortunately, this is not achievable for all", Sergeant Major Chris adds. "The ORAC course is split into three basic parts: lectures, practical lessons, and scenario training" he underlines. This course was his eleventh edition, having participated in both, ORAC and FAMET.

"The ORAC course is one of the last parts of our operational readiness for the forward aeromedical evacuation" Sergeant Major Chris explains. "As a nurse or physician, one must first undergo general military and medical training. After placement at the OGZ, the following education and training courses must be completed; for example, OSEG KLU (emergency medical Royal Netherlands Air Force training) where participants learn how to take care of trauma patients as a team in an Air Force composition with Air Force equipment. BLS/ILS/ALS: Basic Life Support, I Immediate Life Support, A Advanced Life Support: Courses that provide a standardized approach to cardiopulmonary resuscitation of adults (among them are also CPR courses). Other trainings are for example in the field of survival, safety, and equipment", Sergeant Major Chris adds."A follow-up training to the

ORAC is the FAMET (Forward Aeromedical Evacuation Training). This is training in which elements are added to the final objectives of the ORAC. All this is simulated to offer training that is as realistic as possible in which as many facets of the forward AE as possible are discussed. We are currently revising the ORAC. This is to ensure that the course connects even better with the other courses and training in the future". Sergeant Major Chris concludes.

"We try to fly as stable as we can during the training to allow participants to get used conducting their training tasks during flight. We try to keep the communication to a minimum to allow the participants to work on the helicopter's intercom during their evacuation training" explains Michiel, one of the pilots of the RNLAF 298 Squadron involved in the course. "In general, the learning curve is clearly visible. Although we only get a superficial understanding of their actions, it is important that the participants provide updates to the aircrew during these flights. For example, the destination where they want us to go with the patient, any flight restrictions that the injury entails for the patient, and all that is needed at the drop-off location (specialist teams and resources) have to be communicated. At the beginning of the course, this is often forgotten, but after a few flights, we notice the improvement in communication with us as flight crew" adds Michiel.

"The most important part of the training is how to approach and work safely in an operationally flying helicopter. Participants learn how to be secure during the flight, they also have to move the patient, all equipment, and the medical backpacks in the helicopter. Secondly, they have to learn how to communicate on board" according to Major Sven, A3 current OPS of Operational Health Department (Operationele Gezondheidszorg/OGZ).

Major Sven continues "Flying is done with open windows and tail lift so that you also have to deal with drafts and noise during the flight. In addition,

The helicopter acts as a flying ambulance in these cases. This is a typical scenario which can occur in a real-life situation during a deployment or as part of an evacuation of military servicemen.

1

Role Support – Medical Treatment Facilities

The term "Role" or "Echelon" is used to describe the stratification of the four tiers in which medical support is organized, on a progressive basis, to conduct treatment, evacuation, resupply, and functions essential to the maintenance of the health of the force. "Echelon" or "Role" is defined on the basis of capabilities and resources, and is not specific to particular medical unit types. The term "role" is used by land or air forces, while "echelon" is primarily a maritime term. While closely related, they are not exactly interchangeable. The treatment capability of each role/echelon is intrinsic at the higher level, e.g. a role 3 facility will have the ability to carry out role 2 functions. Each level of support has the responsibility to resupply and otherwise support the levels below them. There is no requirement that a patient must necessarily pass through each echelon of care in progression during treatment and evacuation.

Role / Echelon 1 medical support is that which is integral or allocated to a small unit, and will include the capabilities for providing first aid, immediate lifesaving measures, and triage. Additionally, it will contribute to the health and wellbeing of the unit through provision of guidance in the prevention of disease, non-battle injuries, and operational stress. Normally, routine sick call and the management of minor sick and injured personnel for immediate return to duty are a function of this level of care.

Role / Echelon 2 support is normally provided at larger unit level, usually of Brigade or larger size, though it may be provided farther forward, depending upon the operational requirements. In general, it will be prepared to provide evacuation from Role/Echelon 1 facilities, triage and resuscitation, treatment and holding of patients until they can be returned to duty or evacuated, and emergency dental treatment. Though normally this level will not include surgical capabilities, certain operations may require their augmentation with the capabilities to perform emergency surgery and essential post-operative management. In this case, they will be often referred to as Role 2+. In the maritime forces, Echelon 2 is equivalent to the land forces' Role 2+, as a surgical team is integral to this echelon. Maritime echelon 2 support is normally found on major war vessels and some larger logistics or support vessels, and at some Forward Logistics Sites.

Role / Echelon 3 support is normally provided at Division level and above. It includes additional capabilities, including specialist diagnostic resources, specialist surgical, and medical capabilities, preventive medicine, food inspection, dentistry, and operational stress management teams when not provided at level

2

2. The holding capacity of a level 3 facility will be sufficient to allow diagnosis, treatment, and holding of those patients who can receive total treatment and be returned to duty within the evacuation policy laid down by the Force Surgeon for the theatre. Classically, this support will be provided by field hospitals of various types. Maritime Echelon 3 is equivalent to land/air forces Role 3, though it will normally have increased specialty capabilities. Echelon 3 is normally found on some major amphibious ships, on hospital ships, at Fleet Hospitals, at some FLS, and at a few Advanced Logistics Support Sites (ALSS).

Role / Echelon 4 medical support provides definitive care of patients for whom the treatment required is longer than the theatre evacuation policy or for whom the capabilities usually found at role/echelon 3 are inadequate. This would normally comprise specialist surgical and medical procedures, reconstruction, rehabilitation, and convalescence. This level of care is usually highly specialized, time consuming, and normally provided in the country of origin. Under unusual circumstances, this level of care may be established in a theatre of operations.

Source: NATO Logistics Handbook – Medical Support

1 A soldier assists the physician in resuscitating the patient with cardiac massage.

2 Together with a physician, the Primary Triage Officer assess the condition of the wounded.

3 This wounded soldier is catgeorized as 'Priority Group 3 – Green or Delayed'.

4 A wounded soldier is brought to the helicopter for immediate transport to an MTF (medical treatment facility).

Triage Officer (TO)

The primary duty of the triage officer is to:

- *Quickly remove the deceased from the triage area.*
- *Ensure that every patient receives a primary assessment.*
- *Immediately identify the most critically injured patients.*
- *Evacuate patients to the most appropriate treatment area.*

Primary Triage Officer (PTO)

The Primary Triage Officer is responsible for the coordination of triage by all resources. The PTO will ensure teams of suitably qualified staff will perform a triage sieve of all casualties at the scene of the incident. The PTO will report to the operational commander with the number and status of casualties so that appropriate arrangements can be implemented to enable their effective treatment. Dependent upon the nature of the incident and the area the incident covers, there may be the requirement to have multiple PTOs, for example when an incident scene is 'sectorized'.

3

4

1	Two of the participants are discussing the best way to help the wounded.
2	One of the patients is being mobilized for the helicopter flight back to Gilze-Rijen AB.
3, 4, 5	Retracting the wounded from the training grounds to the helicopter.

tactical flying is regularly performed (depending on the type of mission). All this is done to mimic reality as much as possible. There is also a static night exercise in which you have to examine and stabilize a patient with very limited light options (light discipline). First of all, there is an introductory flight where you can get used to the helicopter and the behavior of the various equipment during flight movements (tactical flying). Subsequently, various mission flights take place in which you land at a point of injury (incident location), you briefly map the patients there, and if necessary and possible, whether or not under threat, stabilize and prepare for air transport. In the event of a "hot" landing zone, the medical team, including an Air Mobile Protection Team (AMPT), immediately loads the patient. The participants should make a clear plan of where the patient should be transported to (nearest medical treatment facility, Role 2 or Role 3) and answer questions such as how to fly to the pilot (low and loud gives a lot of vibration and will be painful for a patient with fractures) and whether there is a height restriction (for a patient with, for example, a collapsed lung). When the helicopter returns, a sign from the loadmaster must be clearly observed to see if the helicopter can be approached, after which the patient is transported to the helicopter. The patient is then secured on the stretcher and connected to the monitor, after which he is taken to a medical treatment facility. Because of the potential threat, it is often impracticable to

stabilize the patient before transport and the first assessment and treatment of the patient often takes place in a flying helicopter with all conceivable stresses of flight" concludes Major Sven.

"Each mission is assessed by two instructors and it is always a combination of a medical specialist, physician, and flight nurse instructor. This duo is cooperating first on the AE skills (safety, communication, situational awareness, collaboration as a team) and secondly on medical content. At the end of each course day, the results of all participants are discussed and if necessary, areas for improvement identified by the instruction team" explains Lt Col Johan. The training course also concludes with a theory exam and at least five missions performed where the candidate is in the lead during multiple times. All missions flown are assessed and reviewed using a standard checklist and evaluation form. The missions become more complex as time goes by, and the participant must show the corresponding increasing achievement.

Lt Col. Johan continues "ORAC training has been around for more than ten years and is performed at least once a year. Belgian colleagues also participated in the ORAC. In 2018, at the request of the Canadian Armed Forces, an ORAC was even provided (by a Dutch AE instruction team) for Canadian physicians, nurses, and medical technicians, to support them in their operational readiness preparation for the Canadian Aeromedevac (UN) mission in 2019 in Mali. During this collaboration, communication was in (medical) English. The AE instructors assessed and supervised the Canadian colleagues. The Canadian colleagues were very satisfied with this intensive way of cooperation, guidance, and feedback. The ORAC is an excellent course in the field of aeromedical evacuation and is assessed as very valuable and evaluated very well in collaboration with the instruction team. However, additional, short, type-specific training (depending on which airframe is available) in the context of mission-oriented training remains necessary. Clinical experience should remain the guiding principle and annual internships are desirable. Making many flying hours and multidisciplinary cooperation increase the operational character. The ORAC course is seen by the participants as good preparation for actual deployments."

The next step in the training syllabus is the FAMET (Forward Aero Medical Evacuation Training) which is additional training to achieve the fully operational status of the flight physician and nurses. The scenarios are more complex and include simulated hostile scenarios. Participants will continue with the FAMET course a year after finalizing ORAC.

The following FAMET course will be held again in the United States in the first half of 2022 at Fort Hood, Texas.

The goal for the ORAC participants is to become more familiar with the equipment and materials used in the Aeromedical Evacuation role, which is a vital component to be able to work in this environment.

SENTRY EAGLE 2022

REPORT BY RALF PETER WALTER
AND MATHIAS LEISCHNER

Two F-15C *Eagles* assigned to 173rd Fighter Wing of the Oregon Air National Guard (OR ANG) at Kingsley Field ANGB are waiting until it is their turn at the 'boom' of a KC-135 asssigned to the 141st Air Refueling Wing, 116th Air Refueling Squadron of the Washington ANG at Fairchild AFB to top-off their fuel tanks.

Kingsley Field – America's Air Superiority Starts Here

Kingsley Field's 173rd Fighter Wing is the only F-15C *Eagle* Formal Training Units of the U.S. Air Force and operates 32 F-15C/Ds. As a training unit they are assigned to the Air Education and Training Command.

About 45 student pilots of both the U.S. Air Force and the U.S. Air National Guard receive their F-15 training at Kingsley Field. Currently, there are approximately 30 instructor pilots assigned to the 173rd FW. All of them are male, however, one female pilot is going through the initial qualification course and she soon will join the team after having graduated. The wing flies about 3,500 hours per year.

High-speed low-pass with full afterburner of an F-15C *Eagle*.

From college into an Eagle's cockpit

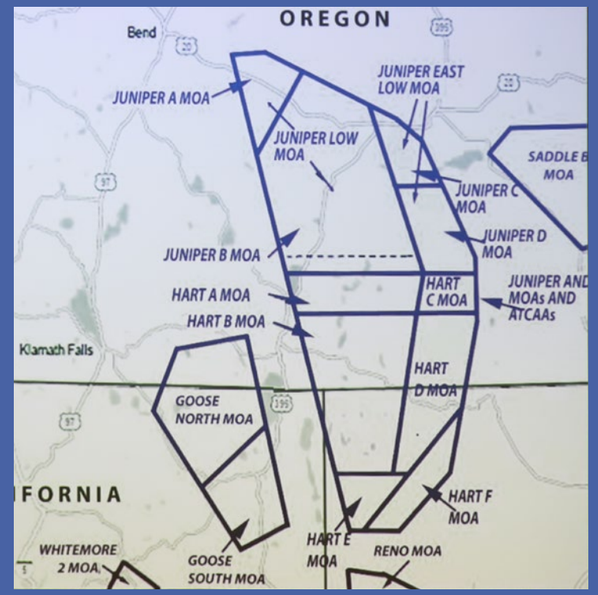
Colonel Lee Bouma

"To become an U.S. Air Force pilot, first, you have to have a college degree and then, you get picked up to be a pilot. You go up to get all the medical screenings, become an officer, and then pilot training starts. There are two different pilot training bases around in the U.S.. First, you fly the T-6 aircraft, then, you fly the T-38 which is much like the F-5 aircraft. And then, eventually, once you graduate those programs, and that's usually with probably about 200 hours of flying time, you really have learned how to fly a fast moving plane. At that point, you would be showing up here and we let you fly for about five times just to learn how to fly this airplane point a to point b. After that, the rest of the seven months, it's been teaching people how to fight with an airplane. So really starting in the basics of one aircraft against one aircraft training TOPGUN style dogfight where you can see each other and then, moving out in the course from there where there are multiple aircraft. Usually, up to four good guys against six to eight bad guys is how we like to end the course, going outnumbered against our adversaries."

Colonel Lee Bouma is the 173rd Fighter Wing's commander. He has flown 22 combat sorties in Operation Iraqi Freedom and has over 75 hours of combat time. He is a senior pilot with over 2,000 total flight hours in the T-37, T-38C, F-16B/C/D, F-15C/D and C-130H1/2/3.

F-15 Initial Qualification Course

The F-15 Initial Qualification Course also known as F-15 Basic Course teaches the student pilots how to employ the aircraft in a combat scenario. The course comprises 130 training days with 280 hours of academics, 47 simulator sessions totaling 70 flight hours and some 46 real sorties adding another 56 flight hours. After successful completion of the course, the 'new' F-15 pilot is qualified to use the aircraft in the air superiority role as a single aircraft or as a wingman, day and night. He/she is capable of performing day/night air-to-air refueling and conducting basic low altitude and air-to-air missions. From Kingsley Field, the graduate goes to the operational unit to receive Mission Qualification Training and subsequently achieve Basic Mission Capable (BMC) or Combat Mission Ready (CMR) status.



Uncongested Airspace

Unique to Kingsley Field is the availability of uncongested airspace in close proximity. The USAF's F-15C training syllabus requires approximately 40% of the training missions to be Beyond Visual Range. About half of these missions require setup ranges in excess of 80 nautical miles (NM). The «Juniper-Hart» training airspace (military operations area – MOA) extends approximately 170 mi in length and up to 60 mi in width over Central Oregon and Northern Nevada. «Juniper-Hart» is used for intercept training and about 90 nm away from Kingsley Field. Used for dogfight training, «Goose» MOA is only 25 nm away. Most of the training airspace is over very sparsely populated areas. The low flying MOAs range from 500 ft AGL to 10,999 ft MSL, all other MOAs range from 11,000 ft MSL to 17,999 ft MSL.

Definition: A MOA is an airspace established outside Class A airspace (i.e., below 18,000 feet above mean sea level) to separate or segregate certain nonhazardous military activities from instrument flight rules ("IFR") air traffic and to identify for visual flight rule ("VFR") air traffic where these activities are conducted. 14 C.F.R. § 1.1. MOAs are a type of "non-rulemaking" Special Use Airspace.

For this air-to-air refueling mission, the KC-135 *Stratotanker* flew a rectangular track at an altitude of 22,000 ft AGL. During about two minutes at the refueling boom, each of the F-15s received between 4,000 and 5,000 lbs of fuel while flying at a speed between 300 and 315 KIAS.

141st AIR REFUELING WING

The Washington Air National Guard's 141st ARW, 116th ARS is based at Fairchild AFB. It is an associate unit to the U.S. Air Force's 92nd ARW and borrows their aircraft, as needed. The KC-135R '60-0320' **(main image, right)** is assigned to the 92nd ARW despite the MacDill AFB, Florida based 6 ARW, 927 ARW markings.

116th AIR REFUELING SQ


ARW
927 ARW


KLAMATH FALLS
OREGON
AF
80 013
KINGSLEY FIELD


OREGON
AF
80 049
KINGSLEY FIELD


6 ARW
927 ARW


6 ARW
927 ARW


6 ARW
927 ARW


6 ARW
927 ARW

Sentry Eagle Open House – "Once every couple of years, we open the doors and allow all of our community to come in here and see what Kingsley Field really provides to our community and to watch what we do to make the worlds greatest air superiority pilots right here."

Col. Lee Bouma, Commander of the 173rd Fighter Wing.

The crew chief signals the F-15D *Eagle's* pilot to stop the aircraft at its final parking position while rest of the ground crew is prepared to chock the wheels and service the aircraft after the engines are shut down.

A-10C assigned to 354th Fighter Squadron at Davis-Monthan AFB, Arizona of the **A-10C *Thunderbolt II* Demonstration Team.**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The U.S. Air Force Heritage Flight program presents the evolution of USAF air power by flying today's state-of-the-art fighter aircraft in close formation with vintage fighter aircraft such as this P-51D-30NT *Mustang* built in 1945.

Tactical Air Support, Inc., is a U.S. company headquartered in Reno, Nevada and provides domestic and international training and support services in tactical aviation.
Tactical Air deploys advanced aircraft operated by experienced fighter and attackpilots to U.S. military installations in support of Navy, Marine Corps, Air Force, and Army unit, wing, weapons school, and combat deployment training.
Under a 4-year contract, the company permanently deployed some F-5AT Advanced Tiger to Klamath Falls ANGB in the fall of 2020 to provide the 173rd Wing with 'Red Air' services at the F-15C *Eagle* training.

Royal Canadian Air Force CF-188 (F/A-18A) *Hornet* assigned to 409 Tactical Fighter Squadron.

This Republic P-47 *Thunderbolt* with construction number 399-55616 was built in 1944.

This Grumman F8F *Bearcat* with construction number D-211 was built in 1949.

Main image: Boeing B-17G *Flying Fortress*, civil registration N3701G, built in 1944.
Insets left to right: P-51D built in 1945, civ. reg. N151AF | P-51D, bulit in 1944, civ. reg. NL751RC | P-51D, built in 1945, civ. reg. N551D.

C-130H *Hercules* assigned to the Delaware Air National Guard's 142nd Airlift Squadron based at New Castle ANGB.

OSTRAVA NATO DAYS 2021

ARTICLE BY WOLFGANG JARISCH

A trip to the NATO Days in Ostrava is always worth a visit – the visitors are rewarded with a varied program, both, on the ground and in the air. Due to the COVID-19 situation, the number of visitors was limited. 60,000 visitors registered online for Saturday, 18 September and 27,000 for Sunday, 29 September.

The 2021 Special Partner Nation was again Sweden, which sent some aircraft of its Swedish Air Force Historic Flight. Unfortunately, the announced Saab J-29 *Tunnan* did not make it to Ostrava. Instead of the J-29, they brought the J-32 *Lansen* to Ostrava, being joined by the legendary AJS-37 *Viggen* and the Sk35C *Draken*. The Swedish contingent comprised two single-seat *Gripens* and a two-seater *Gripen*. In addition to representatives of the Swedish Ministry of Defence, representatives of the Swedish Armed Forces and the Swedish Defense Material Administration participated in the event. Sweden was the Special Partner Nation at the NATO Days in 2015 and is the only country that was selected twice for this role.

This year's event again held some highlights for the spectators. The U.S. Air Force brought its C-5M *Galaxy* super transporter to Ostrava. The *Super Galaxy* was

Czech Air Force Mi-35 assigned to 221.vrl

▲ Czech Air Force Mi-32 of 221.vrl
▼ Czech Air Force Mi-171Sh of 222.vrl

loaded with UH-1Y *Venom* and AH-1Z *Viper* helicopters of the U.S. Marine Corps and one MQ-9 *Reaper* UAV. The Czech Republic soon will be the first European customer to receive the *Venom* and the *Viper*.

The Swedish multi-role aircraft JAS39 *Gripen* was not only presented by the Swedish Air Force but also by Hungary and the Czech Republic. After its debut in 2019, the new Czech training aircraft L-39NG was seen at its premiere demonstration.

There was no shortage of F-16 displays either. The high-speed displays of the 'Solotürk' F-16 and the Greek 'Zeus Demo Team' brought real air power to Ostrava.

In addition to helicopters from the International Helicopter Training Center, a Bell 206 and a Eurocopter EC-135, Germany brought two Airbus A-400M *Atlas* to Ostrava, one of which participated in the flying display.

A rare visitor was one of six CF-188B *Hornets* from the Royal Canadian Air Force which were deployed in Romania for three months for NATO Air Policing.

In addition to the German helicopters, other rarely seen helicopters also found their way to Ostrava.The Czech *Gripen*, the L-159 ALCA, and two Dutch F-16s were on static display only. For the first time, a Lockheed Martin F-35A *Lightning II* touched down on Czech territory. The F-35A of the Italian Air Force was one of the highlights of this event.

Besides the well-known helicopters, Mil Mi-24/35, Mil Mi – 171, and W-3A of the host country, some very interesting helicopters were on display at Ostrava. In addition to the U.S. Marine Corps *Venom* and *Viper*, the U.S. Army sent one UH-60L *Black Hawk* and one AH-64D *Longbow Apache*. The Slovak Air Force was present with two of their new *Black Hawks*, one in the static and one for the flying display. The Belgian Air Force sent the solo display team 'Razzle Blades' with their specially painted AW 109. The Swiss Air Force took part in the flying display with the 'Super Puma Display Team'.

The author thanks Anna Buchtíková and her team for making this report possible.

▲ Swiss Air Force AS532UL *Cougar*
▼ Czech Air Force W-3A *Sokół*

Bell 206 *JetRanger III* from Motorflug Baden-Baden GmbH, used by the German Army Aviation for basic helicoter training ▲ and an EC-135 from Air Transport Euope ▼

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1 German Army Aviation EC135T1 of the International Helicopter Training Center
2 Belgian Air Force A109BA of the 'Razzle Blades' helicopter display team
3 Slovak Air Force Sikorsky UH-60M of 51. Kridlo Presov

Czech Air Force W-3A *Sokól*s assigned to 243.vrl

▲ Sk35C *Draken* with F16 markings
▼ J32B *Lansen* with F3 markings

AJS37 *Viggen* with F7 markings ▲
Tp103 *Citation* with F17 markings ▼

Top: Swedish Air Force Lockheed Tp84 (C-130 *Hercules*) of 71st Airlift Squadron
Left and right: Czech Air Force CASA C295MW of 242.tsl

German Air Force A400M *Atlas* of Lufttransportgeschwader 61

▲ Hellenic Air Force F-16C Block52+-CF of 340 Mira
▼ Italian Air Force F-35A of 13° Gruppo

Royal Netherlands AF F-16AM of 312 Squadron ▲
Swedish Air Force JAS39D of F17 ▼

Swedish Air Force JAS39D
and JAS39C of F17

▲▼ Czech Air Force JAS39C *Gripen*

Turkish Air Force F-16, 'Solotürk Display Team' ▲
Royal Canadian Air Force CF-188 *Hornet* ▼

Swedish Air Force JAS39C of F17

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1 Slovenian Air Force PC-9M of 152.LEESK
2 Slovenian Air Force Let L-410UVP-E *Turbo Let* of 152.LEESK
3 U.S. Air Force Beechcraft C-12 *Huron* of the U.S. Embassy Flight, Budapest
4,5 Czech Air Force L-159A *Albatos* of 212.tl
6 L-39NG of the Czech aircraft manfacturer Aero Vodochody

U.S. Air Force Boeing-Bell CV-22B of 7th SOS

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1 U.S. Air Force Nebraska Air National Guard KC-135R of 173rd ARS
2 Hungarian Airbus A319-112 of MH 59. Sz.D. REB.
3 Uzbekistan Airlines Boeing 767-33P/ER

U.S. Air Force Lockheed C-5M of 68th Airlift Squadron

▲▼ German Air Force Bombardier Global 5000 of Flugbereitschaft des Bundesministeriums der Verteidigung (FlBschftBMVg)

Bombardier Global 6000 of SAAB Aircraft Company ▲▼

ANNIVERSARIES OVER FLORENNES

PHOTO-REPORT BY KRIS CHRISTIAENS & GERT TRACHEZ

On June 16th, 2022 the Belgian Air Force invited some aviation photographers for an exclusive air-to-air photo shoot of two specially painted F-16 fighter jets from its Florennes Air Base. One of the two F-16s (FA-57) had a special tail painting for the 105th anniversary of the 1st Squadron *Stingers*, the other (FA-86) had a special tail painting to celebrate the 80th anniversary of the 350th Squadron *Ambiorix* which was in 2021. Both fighter squadrons are based at the Florennes AB in the southern part of Belgium and are part of the 2nd Tactical Wing. During this unique photo shoot, both fighters flying behind an Airbus A400M, could be extensively photographed while they performed numerous maneuvers over the region of the Florennes AB. The pilot of the 1st Squadron anniversary F-16 was the former Belgian Air Force F-16 'Dark Falcon' demo pilot Stefan 'Vador' Darte.

The authors would like to thank the Florennes AB, the IPR department of the Belgian Air Force, and the 15th Wing Air Transport for this fantastic photo shoot.

F-16AM with serial FA-57 has different designs on either side of the tail. The port side shows the Scottish thistle, the 1 Squadron's insignia; the starboard side displays "Stingers Rule", which is the slogan of the squadron's pilots.


1941
2021
350 (F) SQN


80 YEARS
350
(F) SQN


80 YEARS
350
(F) SQN
105 YEARS
SQUADRON


105 YEARS 1 SQUADRON
TIGERS

The pilot of the 1st Squadron anniversary F-16 was the former Belgian Air Force F-16 'Dark Falcon' demo pilot Stefan 'Vador' Darte.

"Thumps up" from Stefan 'Vador' Darte in the 1 Squadron's anniversary F-16. He also was the pilot the Belgian Air Force's F-16 Dark Falcon demo aircraft.

UKRAINIAN FENCERS

ARTICLE BY RALF JAHNKE

This report provides an insight into the operations of the Ukrainian *Fencer* until the beginning of the Russian invasion. There are no independently confirmed reports during the war, so we do not wish to engage in speculation about the Su-24's missions in this war.

The most powerful combat aircraft of the Ukrainian Air Force is the Su-24 *Fencer* bomber. The frontline fighters are based at the 7th Tactical Aviation Brigade (7th TAB) at Starokostiantyniv AB in the region Olast Khmelnytskyi. The unit is named after "Petro Franko," a prominent figure and pilot in the Ukrainian Revolution and is under the Air Command West. The 7th TAB comprises two aviation sections: one squadron with the Su-24M *Fencer D* bomber and one with the Su-24MR *Fencer E* tactical reconnaissance aircraft and L-39 *Albatros* training aircraft.

In 1992, after the collapse of the Soviet Union, the Ukrainian Air Force took over a total of nine regiments of Su-24 frontline bombers. These were large numbers, and in total, the Air Force inherited 120 Su-24M *Fencer D* bombers, 90 Su-24 *Fencer A* to *C* bombers, and 35 Su-24MR *Fencer E* tactical reconnaissance aircraft. Many regiments were already disbanded in the 1990s, except for the 7th Tactical Aviation Brigade. This unit is the last Su-24-equipped frontline aircraft outside Russia in Eastern Europe.

Before the war, the 7th TAB had 28 Su-24M bombers and 12 Su-24MR reconnaissance aircraft in its inventory. However, many aircraft are parked at the airbase in a decommissioned status. Only a small number of about fourteen Su-24Ms and eight Su-24MRs were airworthy.

In April 2014, due to the "Crimean Crisis" and the armed conflicts with Russia in Donetsk and Lugansk in eastern Ukraine, the 7th Tactical Air Brigade began intensifying flight training. Older pilots were reactivated, pilot training was increased and tactical procedures were adapted to the situation. This included, in particular, low-altitude training to

Sukhoi Su-24MR *Fencer E* swing-wing tactical reconnaissance aircraft.

penetrate strong enemy air defenses. The aircraft is technically capable of performing an automatic terrain-following flight with its radar. Overall, the Ukrainian Air Force suffered some losses attributed to strong air defenses. The war in the Donbas also had a direct impact on the 7th TAB.

To strengthen the combat capability, the Aircraft Repair Plant in Mykolayiv received an immediate order for the major overhaul of six Su-24s. The first aircraft, Su-24M serial 41 white with a "pixel" color scheme, was delivered to the 7th TAB in October 2014. The cost was EUR 4.5 million per aircraft. Further deliveries to the unit followed over the next four years. These aircraft came from the unit's storage depot and in some cases had been out in the open for more than 20 years. In addition, other active aircraft received life extensions from the Mykolaiv plant.

The Ukrainian Air Force conducted more reconnaissance flights with Su-24MR along eastern Ukraine. The MR version features standoff reconnaissance sensors through SLAR and ELINT. For tactical reconnaissance, the aircraft were moved closer to the eastern border to active and reserve airfields.

Until Russia's invasion, flight operations were conducted several days a week, day or night, usually with seven Su-24s and three L-39 *Albatros* training aircraft in three to four "waves" at Starokostiantyniv AB. The first sortie is an L-39 to check the weather in the area of operations.

Some *Fencers* are in QRA (quick reaction alert) status, loaded with live ODAB-500 bombs and ready to defend the independence of Ukraine.

This Su-24MR carries a Tangazh Sigint pod under the centerline and two PTB-3000 external fuel tanks with a capacity of 3,000 liters each.

Su-24MR *Fencer E*

The **MR-version** is a tactical reconnaissance aircraft. The basic reconnaissance package is the BKR-1 Bortovoy Kompleks Razvedki (Onboard Reconnaissance Complex) which incorporates the Shtyk (Bayonet) SLAR and a Zima (Winter) imaging infrared reconnaissance system in the nose. In addition, the aircraft carries various combinations of the Aist-M (Stork) TV reconnaissance pack, the AP-402 and A-100 wet film cameras, the Ehfir-1M (Ether) radiation monitoring system, the Shpil-2M (Steeple) laser line scan unit and the Tangazh (Pitch) ELINT system in external pods. Using an on board wide-band radio channel the aircraft can transmit data from some sensors in near real time to dedicated ground stations. In addition, the camera pod can also develop film in-flight, which can then be dropped inside a special canister to a ground based command post or mobile Reconnaissance Intelligence Cell (RIV).

The Su-24MR is equipped with the Khadir optical sensor which is housed in a fairing with two windows for downward-looking cameras. An AFA-A-100 forward-facing camera is mounted under the port engine intake.

STAROKOSTIANTYNIV AB 2015

Low pass of a Su-24M *Fencer D* bomber with wings fully swept forward.

Su-24M *Fencer D* bomber.

Su-24M *Fencer D* bomber taxiing to the runway for a training sortie.

Su-24MR *Fencer E.* For take-off and landing the wings are fully swept forward at 16°.

Su-24MR *Fencer E*. The Su-24 wing has four sweep settings: 16° for take-off and landing, 35° and 45° for cruise at different altitudes, and 69° for minimum aspect ratio and wing area for flying with high speed at low-levels.

Su-24M *Fencer D* bomber in the storage area.

Su-24MR *Fencer E*

Su-24MR *Fencer E*


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Su-24M *Fencer D* with a refreshed old color scheme.

Su-24MR *Fencer E* with shark mouth, the mark of the recon.

Armament of The Su-24M Bomber

- 1 × onboard 23 mm GSh-6-23 cannon, 500 rounds of ammunition.
- Up to 8,000 kg (17,640 lb) ordnance on 8 hardpoints, including
  - up to 4 × Kh-23/23M radio-command missiles;
  - up to 4 × Kh-25ML laser-guided missiles;
  - up to 2 × Kh-28, Kh-58E or Kh-58E-01, or Kh-31P ARMS;
  - up to 3 × Kh-29L/T laser/TV-guided short-range air-to-surface missiles;
  - up to 2 × Kh-59 or Kh-59ME TV-command guided missiles, Kh-31A anti-ship missiles, S-25LD laser-guided missiles, KAB-500KR TV-guided and KAB-500L laser-guided bombs.
- Unguided rocket launchers with 240 mm S-24B rockets or 340 mm S-25-OFM rockets.
- Other weapon options include general-purpose bombs AB-100, AB-250 M54 or M62 and AB-500M-54, thermobaric bombs ODAB-500M, cluster bombs RBK-250 or RBK-500, small-size cargo pods KMGU-2, external gun pods SPPU-6, external fuel tanks PTB-2,000 (1,860 l) or PTB-3,000 (3,050 l)
- 2 × R-60 or R-60MK air-to-air missiles are normally carried for self-defense; upgraded aircraft can carry R-73E as well.

Su-24M '41 white' received this pixel color scheme after refurbishment at the Nikolaev Aircraft Repair Facility in 2014.

Su-24M *Fencer D* lands with double drag chute after a mission.

Main Image: Su-24MR with wings fully swept forward.
Insets: Many *Fencers* parked at the airbase are not in an airworthy condition.

DEPOSITORY AT BILA TVERSKA AB JULY 2017

After the collapse of the Soviet Union, Tu-16 *Badgers* of the 251st Guards Instructor Heavy Bomber Aviation Regiment (251 ITBAP) were stationed at Bila Tverska AB until 1993. After the unit was disbanded, all of Ukraine's Tu-16s were stored here and then scrapped.
Until 2007, Bila Tverska AB was used to store and process aircraft of the Air Force of the Armed Forces of Ukraine. Today, there are still more than thirty Su-24s of all versions and serve as spare parts donors for the air force.

Main Image: Su-24 *Fencer C*, the oldest type of the Ukrainian Air Force.

Right: Su-24M *Fencer D*, with serial 15 blue from Kanatovo AB.

Left: A decomissioned pair of Su-24 *Fencer*s from Starokostiantyniv AB.

CYPRUS AIR COMMAND

ARTICLE BY
MILITARY AVIATION REACHOUT

Following the establishment of Cyprus as an independent country, on 16 August 1960, an Air Wing equipped with a small number of light aircraft was established at Andreas Papandreou AB located within Paphos International Airport. This marked the beginning of the Cyprus Air Force. The Air Wing performed search and rescue tasks (SAR), transport of the sick, control of fires and marine pollution as well as defense and police forces on the Cypriot coast and territory. In 1987, three Bell 206 *Long Ranger III* light helicopters, four Aérospatiale SA342L1 *Gazelle* utility helicopters, and two Pilatus PC-9 intermediate trainers were added to the Air Wing.

From this moment on, the Cyprus AF adopted a camouflage livery and added national insignia on all aircraft including the national flag and the classic cockade that perfectly follows that of Greece, a nation with very close ties with Cyprus. In addition, facilities were built to support all these aircraft types, including relevant taxiways, hardened aircraft shelters, and integrated command and control and communication facilities.

On 8 November of each year, the feast of the Archangel Michael, protector of the Air Force, the Cyprus AF hosts a series of Open Days to showcase its equipment, to attract new blood to the air force to serve the country. Unlike previous years, in 2021 the open days were held for only one day, unlike the usual two days due to the current COVID-19 situation. Gates opened to the public from 1 p.m. until 4 p.m. The static display offered every type of aircraft the Air Force operates and several anti-aircraft and air defense systems.

The aircraft present were three Mi-35P *Hinds*, one SA342L1 *Gazelle*, one AW-139, one Aerostar Tactical UAV, and one B206L3 which was already towed out of the static display to be prepared for the afternoon flypast over the base. At around 2 p.m., two Mi-35P, two SA342L, two AW139, and two B206L3 took off from the adjacent apron for an island tour performing a flypast over Nicosia, Ayia Napa, Larnaca, Limassol, and Paphos.

To avoid unnecessary drain on the on-board battery during extensive checks, the Bell 206 *Long Ranger III* is supplied with external power. Approaching the ramp is an Agusta Westland AW139. Both helicopters are assigned to the 460 SAR Squadron.

55th Combat Group

All aircraft operated by the Cyprus Air Force are managed by the 55th Combat Group, approximately 10km distance from the city of Paphos, on the North side of Paphos International Airport.
The 55th CG was formed in September 1995 and initially included the 420 Air Defense Squadron and four independent Companies. In 2001, the 450 Attack Helicopter Squadron was formed and set under the Group. In 2010 the four Companies merged to form the Combat Support Squadron.
In the same year, the 460 Search and Rescue Squadron was also formed and set under the Group's Command. The latest addition to the Group is the 470 UAV squadron which was formed in May 2019.

The 55th Combat Group is an independent, operational Group, under the Cyprus Air Force Command. Its organization resembles a typical NATO Group.
There are five Squadrons under the Commander's control: the 450 Attack Helicopter Squadron, the 460 Search and Rescue Squadron, the 457 Air Defence Squadron, the 470 UAV Squadron, and the Combat Service Support Squadron. The staff of the Group is divided in three directorates, the Operations, the Support Directorate, and the Personnel Department.
The mission of the 55CG is to maintain a high level of readiness and effectiveness and to conduct successful air operations whenever needed in accordance with current plans. It is achieved by the appropriate organization, training of personnel, and maintenance of the available means and systems.
The role of the airbase has been upgraded in recent years with an increased demand for participation in bilateral and multinational exercises involving civil-military cooperation as well as in bilateral SAR exercises.
The 55th Combat Group is constantly and actively participating in small and large-scale exercises with other countries such as Greece, Israel, the USA, France, Italy, Egypt, Germany, and the UK. Such examples include exercises 'INIOCHOS', 'NEMESIS, and 'MEDUSA'.
Moreover, it participates in SAR exercises within the Exclusive Economic Zone demonstrating the readiness of the country for undertaking SAR missions.

Bell 206 *Long Ranger III*

450 Attack Helicopter Squadron

The 450 Attack Helicopter Squadron was founded on 15 October 2001 with the induction of 12 Mi-35P attack helicopters in the National Guard Air Force. In 2002, its personnel were trained in Russia and were operationally ready to join the National Guard's plans. During the establishment of the squadron, two types of aircraft were also introduced. The Pilatus PC-9 and the BN-2B Islander, which until then, belonged to the Helicopter/Aircraft Squadron. In 2010, these aircraft were transferred to the newly established 460 Search and Rescue Squadron.

In 2010, with the suspension of the 449th Air Operations Squadron based at Lakatamia AFB Nicosia, the four anti-tank SA-342L1 *Gazelle* helicopters were incorporated into the 450 Squadron, upgrading the squadron's operational efficiency through their flexibility and ability to hide in the environment of Cyprus.

The Squadron is split into two platoons, nicknamed 'Scorpion' and 'Panther' flying the SA342L1 *Gazelle* and Mi-35P *Hind* helicopters respectively. Their mission is to provide Close Air Support to National Guard ground units and to execute anti-tank missions.

The Mi-35P *Hind* is a Russian-built helicopter, a newer variant of the very well-known Mi-24 *Hind*. The 'P' denotes the Russian word 'Pushka' which translates to cannon and the main difference from the original *Hind* is that the Cypriot Mi-35P *Hinds* are fitted with fixed undercarriage. It may carry a combination of weapons including anti-tank missiles, anti-armor unguided rockets, a 30mm caliber fixed position cannon, and 23mm caliber cannons.

On the other hand, the SA-342L1 *Gazelle* is a French design and production helicopter, which can also be used in the anti-tank role. It may carry four HOT-3 anti-tank missiles, capable of penetrating 1,300 mm thick steel from a range up to four kilometers. The L1 denotes the export version, fitted with a more powerful Turboméca Astazou XIV engine. The type is also used for airborne observation missions and to train aircrews to convert onto the Mi-35P *Hind*.

The emblem of the squadron depicts a Black Panther, which with the skill shown through how it attacks, symbolizes the determination and the offensive power of 450 Squadron. The blue and purple colors in the background of the emblem symbolize the squadron's ability to operate day and night respectively. The 12 gold stars symbolize the 12 Mi-35P *Hind* helicopters received from 450 Squadron with its establishment. The emblem of the squadron is completed with concentric circles of blue and white, a representation of the Cyprus Airforce Command. The numerical name of the Squadron recalls the year that Kimon,

The Mi-35P *Hind* attack helicopter is armed with a 23-mm cannon and S-8 missiles. The Mi-35P *Hind* can also be re-fitted with 23-mm cannon pods, S-13 rockets, Ataka-VM anti-tank guided missiles, and Vikhr-1 or Vikhr-1M guided missiles against moving ground targets protected with reactive armor as well as medium-speed aerial targets such as helicopters, attack aircraft, and UVA's.


DANGER
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an Athenian statesman and general in mid-5th century BC, departed from Greece heading to Cyprus with only one purpose: to fight against Persians and protect the island.

The squadron's mission is to maintain a high degree of efficiency and readiness to undertake and execute air operations, whenever necessary and in accordance with current operational plans. This is achieved through proper management, personnel training, and maintenance of equipment and systems of the squadron. Moreover, by strengthening interdisciplinary between the commands/units of the National Guard through its participation in operational exercises of the National Guard General Staff.

During operations periods and in case of war, the squadron's primary mission is to conduct offensive, defensive and special operations for the destruction of armored – motorized and unmotorized enemy forces, providing Close Combat Attack and Close Air Support to the ground units of the National Guard.

The Cyprus Air Force operates 12 Mi-35P *Hinds*.


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DANGER

Anti-tank Helicopter SA342L1 *Gazelle*

The Bell 206 *Long Ranger III* is used for helicopter basic training.

For SAR and MEDEVAC, the Cyprus AF operates three Agusta Westland AW139s.

460 Search & Rescue Squadron

The 460 Search & Rescue Squadron was established on 25 May 2010 after the Republic of Cyprus took exclusive responsibility for Search and Rescue missions in its region.

The squadron is equipped with three Italian-made multi-role Agusta Westland AW139 helicopters delivered between December 2010 and July 2011 and two Bell-206 *Long Ranger III* utility helicopters. The BN-2B *Islander* and the Pilatus PC-9 fixed-wing aircraft, which were initially received from 450 Squadron, have now been withdrawn from service and are currently in storage.

The squadron's primary mission is to provide SAR and MEDEVAC (Medical Evacuation) along with helicopter basic training with the B-206. Moreover, squadron aircrews are trained in the secondary missions of the squadron which are parachute dropping, aerial photography, aerial firefighting, personnel transport, and tactical operations.

The emblem of the squadron is the mythological sea god Triton, selected to symbolize the affiliation of the squadron with the sea. On the emblem, the figure of Triton is dominantly displayed over Cyprus, surrounded and protected by the blue and white circles of the Air Force and the control region of Nicosia's FIR. In the background, the watchful eyes of the imperious eagle, symbolize the continuous vigilance and the capability of the squadron for SAR over the entire flight control region of Nicosia. The squadron uses the callsign 'Triton' for the AW139 and 'Paris' for the Bell 206L3.


SQN 460
S A R
CYPRUS AIR FORCE
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470 UAV Squadron

The 470 UAV Squadron is the newest squadron of the Air Force Command in Cyprus. It was formed in May 2019 and is equipped with four Aerostar Tactical UAVs and two ground control stations. The 230 kg (MTOW) Aerostar can stay airborne for 12 hours, operate at a range of 250 km, and carry 50 kg of payloads. The squadron's mission is to provide a high level of readiness and effectiveness, to conduct intelligence surveillance reconnaissance, day and night, whenever needed. The 470 UAV Squadron emblem consists of an abstracted black silhouette bird with staring eyes, indicating the UAV's ability to fly undetected - day and night - and always watchful. It is overlooking the east Mediterranean region to stress its flight range and sensor capabilities, to patrol the whole of Cyprus' FIR.

The 470 UAV Squadron operates four of these Aerostar Tactical Unmanned Aerial Vehicles (UAV), built by the Israeli company Aeronautics Ltd.

BISCAROSSE 2022 ...

ARTICLE BY SARA MORILLO SALAS
AND DAVID MAZÓN

The International Gathering of Seaplanes of Biscarrosse was held on 28 and 29 May on Lake Biscarrosse. This was the 30th anniversary of this unique show in Europe, and in addition to the main show, it included a 'splash-in' (concentration of hydroplanes and ultralight hydros). The event is organized every two years by the local aeronautical community and the city of Biscarrosse. It celebrates the arrival of the Grumman Albatros HU-16A for the Musée de l/Hydroaviation in 2014. On 23 July 1951, this Albatros was delivered to the U.S. Air Force and then, served with the Italian Air Force's 15°Stormo as a search and rescue aircraft. Destined to be scrapped, the museum bought the Albatros in 2014 and restored it in the colors of the U.S. Air Force.

This year, for the first time, there were fireworks and a small airshow after the sunset. Two distinguished veterans participated in the flying display: a 1944-built Consolidated (Canadian Vickers Ltd) PBV-1A Canso A flying boat, the Canadian Vickers version of the PBY-5A Catalina, and a 1945 Douglas DC3. The latter was used regularly by the Queen of England on trips to Canada. Other participants included the Patrouille de France, Rafale M, P-17 Stearman, Autogyro Magni M16, Yak 3, North American T-6 Texan, Extra 260, Pitts Special, and OV-10 Bronco.

This flying boat was originally ordered for the Royal Canadian Air Force as a PBV-1A *Canso A* amphibian, built in 1944 by Canadian Vickers Ltd. It is basically equivalent to the U.S. Navy PBY-5A *Catalina*.

Left: Flywhale FW02-650 ultra-light seaplane
Below: Piper PA-18-150 *Super Cub*s on floats

Bombardier CL-415 firefighting aircraft, operated by the French Sécurité Civile. Scooping at a speed between 80 and 90 kts, the CL-415 can load up to 6,123 l water within about 12 seconds.

Douglas DC-3, built in 1945

BoeingStearman PT-17 *Kaydet*

▲ North American T-6G *Texan*
▼ Canadian Vickers PBV-1A *Canso A*

North American Rockwell OV-10B *Bronco* ▲
Douglas DC-3 ▼

French Navy Rafale M assigned to Flotille 11F at BAN Landivisiau

▲ Breguet Br.1050 *Alize*
▼ Fouga CM-175 *Zéphyr*

Socata TB-30A *Epsilon* ▲
French Navy Rafale M ▼

Main Image: Beechcraft 55
Top left: Pitts S-2S Special
Top right: Extra EA-260 and Christen Pitts S-2S Special
Bottom: FK Lightplanes FK-12 *Comet*

... AND 2018

Grumman HU-16C *Albatross* built in 1955. The amphibian was delivered to the U.S. Navy with BuNo 141262.

Beriev BE-200 ES, the only jet seaplane intended for aerial fire fighting. The BE-200 can load up to 12.000 l of water. To load water, it is capable of water scooping at a sea state of up to three. Its takes up to 14 seconds to refill the empty water tanks.

Boeing-Canada PB2B-1 *Canso A* bulit in 1943. This flying boat served with the 162 (BR) Sqaudron of the Royal Canadian Air Force from March 1943 until April 1946. On 17 April 1944, it sank the German Type VIIC submarine U-342.

▲ Piper PA-18-150 *Super Cub*
▼ Lake LA-4-200 *Buccaneer*.

De Havilland Canada DHC-2 *Beaver* Mk.1 ▲
Transat Aérolac MD-3 ▼

MALTA INTERNATIONAL AIRSHOW 2021

ARTICLE BY WOLFGANG JARISCH

During two years of the pandemic crisis, many air shows around the globe have been canceled. However, at the end of 2021, the situation has improved and the Malta International Airshow returned to the agenda of European airshows.

On the last weekend of September, the organizers were able to bring some very interesting helicopters and planes to Malta. Italy presented a variety of helicopters: a Navy SH-90A, a Guardia di Finanza (Customs Police) PH139D and an UH169A, the Polizia di Stato (Police) an UH139C, and the Vigili Del Fuoco (National Fire Corps) also an AW-139. The display of Italian helicopters from three different agencies and the Navy is a rare sight. An AMX-T and an Italian Air Force Tornado completed the Italian contingent for the Malta Air Show.

Apart from the Italian aircraft, there were more aircraft worth the visit of the static display. The German Air Force sent its 'Goodbye' C-160D *Transall* of Lufttransportgeschwader 63 at Hohn AB, Belgium presented a C-130H *Hercules*, the Royal Danish Air Force a CL-600 *Challenger*, and the Polish Navy displayed a M-28TD *Bryza*.

The Static display was supplemented by the national air force, the Armed Forces of Malta and aircraft form the Malta School of Flying and the Professional Aviation Training Academy. The Maltese air force displayed – static and dynamic – all three types of aircraft currently in service: Agusta Westland AW-139, Beechcraft *Super King Air* B200 MPA, and Aerospatiale SA-316B *Alouette III*. The UAV IAI *Heron Shoval* was not shown to the public.

Paying spotters were able to be on site for the arrivals. To the delight of the spotters, a night shooting was also arranged. Static displays were open to the public on Saturday and Sunday between 9 a.m. and 2 p.m. at the Malta International Airport in front of the new SR Technic Hangar. The flying display took place from 3 p.m. to 6 p.m. at the seafront over Qawra Point to Buġibba Square. The Malta School of Flying and the Professional Aviation Training Academy displayed different variants of Tecnam aircraft, a Piper PA-34 *Seneca*, and a Piper PA-28 *Cherokee*.

The flying display was opened by the Armed Forces of Malta with a flyby of an SA-316B *Alouette III* with an oversized Maltese flag, followed by a *Super King Air* and a SAR demo of the AW139. A highlight was the Swiss PC-7 Team together with the McDonnel Douglas F/A-18C *Hornet*. The Turkish F-16 display team 'Solotürk', the Belgian Air Force with the F-16MLU *Fighting Falcon*, and the French Air Force with the Rafale C excited the spectators with an impressive, very loud demonstration. The British national aerobatic team, the famous 'Red Arrows', provided a perfectly staged finale.

The Malta Air Show is a small but nice air show with a Spotter Day, Night Shooting and a small airshow over the beautiful Buġibba Bay. It is well worth a visit especially, if you can combine this with a few days of vacation.

The Armed Forces of Malta operate three Beechcraft B200 MPA (Maritime Patrol Aircraft) for surveillance, border patrol, fisheries protection, and search and rescue (SAR) duties.

Armed Forces of Malta Beechcraft B200 MPA **(main image)** and SA316B *Alouette III* **(insets).**

Armed Forces of Malta Agusta Westland AW139. The helicopter is used for border control and MEDEVAC/SAR duties.

On the occasion of the retirement of the C-160D *Transall* from the German Air Force, the *Transall* 50+40 of Lufttransportgeschwader 63 received this "Goodbye" livery.

▲ Agusta Westland UH139C of the Italian Police. They operate a total of eight UH139Cs.
▼ NH Industries NH-90 are in use with the Italian Navy as SH-90A. ▼

▲ Italian Air Force AMX-T ACOL of GEA 51° Stormo.
▼ French Air Force Rafale C of ETR03.004.

Italian Air Force Tornado IDS MLU of GEA 6° Stormo. ▲
Turkish Air Force 'Solotürk' F-16C-30-CF of 132 Filo. ▼

▲ ▼ Agusta Westland AW139 of the Italian Vigili del Fuoco – National Fire Corps

Agusta Westland PH139D ▲ and AgustaW estland UH169A ▼ of the Italian Customs Police (Guardia di Finanza)

The Learjet 60 Air Ambulance can transport up to two intensive care patients being cared for by an EMS-physician and a paramedic.

Tunisian Air Force Lockheed C-130B assigned to 21 Squadron.

Belgian Air Force Lockheed C-130H assigned to 20 Squadron with a special "50 Years of Hercules" color scheme.

▲ ▼ Royal Danish Air Force CL-604 *Challenger* assigned to 721 Squadron.

Polish Navy M-28B *Bryza* 1TD assigned to 43.BLotM. ▲ ▼

Royal Air Force aerobatic team 'RED ARROWS' flying with nine BAe Hawk T1As.

Swiss Air Force aerobatic team 'PC-7 TEAM' flying with nine aircraft.

ETAP-C 21-04

ARTICLE BY
DAVID MAZÓN

Spanish Air Force C-130H *Hercules*

The European Tactical Airlift Program (ETAP) is a tactical air transport training program that originated in 2011, when twenty European nations decided to join forces to solve the lack of training opportunities to face crisis management operations.

The ETAP was created to improve the operational capacity of military European air transport through the sharing and exchange of experiences, training opportunities, and training. From 8 to 19 November 2021, the fourth EATP training course EATP-C 21-04 was held at the Multinational Training Center at the Spanish Air Force base Zaragossa. For the exercise, depending on the type of mission, different facilities were used such as Ablitas AB, 90 km north-west of Zaragossa AB, which has a 1,800 m unpaved, dirt runway.

Participating in EATP-C 21-04 were aircraft of seven different nations with a total of 160 people including crew, mechanics, instructors, and support and coordination personnel. There were four C295s (Spain, Czech Republic, Poland, and Portugal), a C27J from Lithuania, a C130J Hercules from Norway and Portugal, and two A400Ms (Germany and Spain).

- The course consisted of about 20 hours of academics and nine missions to be flown by each crew. The missions included:
- advanced planning of intra-theater missions
- parachute drops, both personnel and cargo
- tactical flights with surface-to-air and air-to-air threats with Air Force fighters as aggressors
- flights at very low altitude, using the terrain as masking
- assault shots with personnel extractions and infiltrations
- tactical approach and landing maneuvers
- combat unloading
- loading and unloading operations with engines running.

Thirty-seven crew members successfully completed the course and three cargo supervisors from Bulgaria, Italy and Portugal qualified as instructors.

This Portuguese Air Force CASA C295 applies reverse thrust to decelerate, creating a large cloud of dust.

Main Image: Spanish Air Force Airbus A400M assigned to Ala 31 at Zaragoza AB.

Insets: German Air Force Airbus A400M assgined to Lufttransportgeschwader 62.

▲ Polish Air Force CASA C295M assigned to 8.BLTr (13.el) based at Kraków AB.
▼ Czech Air Force CASA C295MW assigned to 24 zDL at Kbely AB.

Spanish Air Force CASA C295M assigned to Ala 35, 353 Esc at Getafe AB ▲

Main Image and inset right: Royal Norwegian Air Force Lockheed C-130J-30 of 335 Squadron at Gardermoen AB.

Insets left: Portuguese Air Force Lockheed C-130H of 501 Squadron at Montijo AB.

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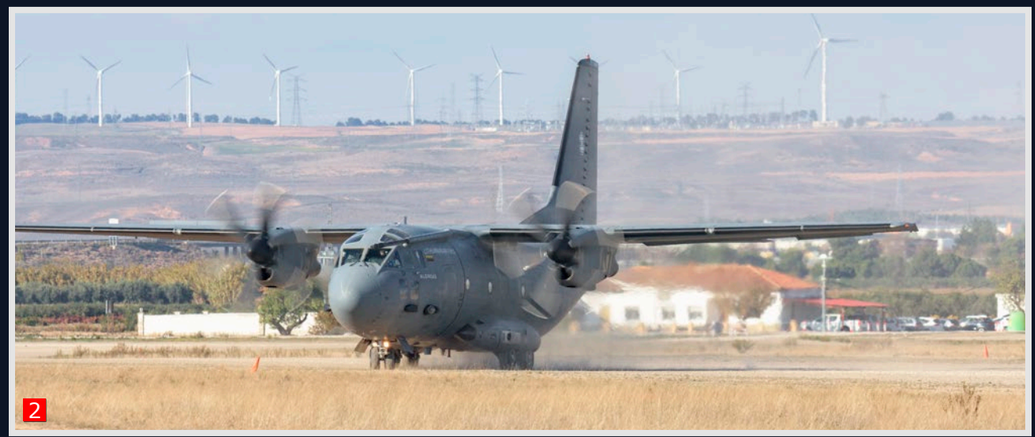

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1, 2, 3 Lithuanian Air Force C-27J of Transporto Eskadrile at Silauliai AB
4, 5 Spanish Air Force CASA C212 assigned to Ala 37, 371 Esc at Villanubla AB

Main Image and inset left: Spanish Air Force CASA C295M assigned to Ala 35, 353 Esc at Getafe AB.

Inset right: Czech Air Force CASA C295MW assigned to 24 zDL at Kbely AB.

CYPRUS POLICE AVIATION UNIT

ARTICLE BY MILITARY AVIATION REACHOUT

The Cyprus Police Aviation Unit (C.P.A.U) was initially given the name of Cyprus Police Air Wing (C.P.A.W) which was established in May 1990 following the purchase of a multiengine BN-2T *Islander* (5B-CPA) and a Bell 412 (5B-CPB). These were later re-registered to 'CP-1' and 'CP-2' respectively.

An interesting fact is that the odd numbers in the registry are allocated to fixed-wing aircraft whilst the even numbers are allocated to rotary aircraft.

The C.P.A.W was a division of Department 'D' of Police Headquarters (Technical and Scientific Department). The establishment of C.P.A.W was the result of political decisions within the various government sectors to promote the Police operational capability for crime prevention and humanitarian aid to the public.

On 10 June 2008, the C.P.A.W became an independent unit, renamed to how it is known today as the Cyprus Police Aviation Unit – C.P.A.U, attached administratively to the Assistant Chief of Police Support Services. The commander of the unit is defined by the Chief of Police.

The base and the premises of the unit are located at Larnaca International Airport, consisting of 2,160m² of hangar space and 1,450m² for offices, stores, and workshops. The hangar along with the adjacent apron space are capable of facilitating other countries' helicopters which can further increase interoperability between the C.P.A.U and other air arms during exercises or firefighting activities. Just recently an Italian Air Force HH-139 for joint training.

Duties and Missions of the C.P.A.U include the following:

- Surveillance of the coasts and territorial borders of the republic, and the patrol of the Nicosia FIR (Flight Information Region) in cooperation with other units to prevent drug trafficking, illegal immigration, and terrorism.
- Supervision and surveillance of the highways and major main roads.

The Bell 412 is equipped with inflatable floats at the landing gear in case of an emergency landing on water.

- Search and Rescue missions for saving lives and property in case of naval and aviation accidents within the Nicosia FIR according to the NEARCHOS Plan.
- Transport of patients or injured persons to a suitable medical center in Cyprus.
- Firefighting and support of other firefighting units according to the IKAROS Plan.
- Locate exhibits underwater with the support of C.P.A.U. divers.
- Transportation of police members and other government personnel for special missions.
- Escorting and transporting high government officials and VIPs upon Chief of Police approval.
- Execution of any missions which are assigned to the C.P.A.U. by the Cyprus Joint Rescue Coordination Center (JRCC).
- Execute any other duties, which are requested by the Chief of Police.

Flying Assets

Currently, the C.P.A.U operates four rotary aircraft which consist of:

- Bell 412 SP *Apollon* CP-2 – delivered 1990
- Bell 412 EP *Akritas* CP-4 – delivered 1997
- AW139 *Achilleas* CP-6 – delivered 2010
- AW139 *Iason* CP-8 – delivered 2010

The sole BN-2T Islander mentioned previously that the Police was operating was sold in 2013.

In 2015, the two Bell helicopters were sent to be repainted with the new blue and white color scheme to replace the older yellow, light blue and white color scheme. This new blue and white color scheme is the same livery of the Agusta Westland helicopters.

The two new Agusta Westland AW139 helicopters were delivered to the C.P.A.U. at the end of 2010. These have increased the operational capability of the unit to meet the continuously increasing demands for missions, as well as to fulfill the Republic's obligations to International Organizations concerning missions such as Search and Rescue, Illegal Immigration, etc.

The AW139 helicopters are IFR-capable and equipped with weather/search radars and VHF-AM (2), VHF-FM, HF, UHF, POLICE/HOSPITAL Radio, and SAT COM for communication purposes. They also carry forward-looking infrared (FLIR) cameras and a side-attached searchlight.

Rescue equipment includes a Direction-Finding Homing Device which uses the reception of radio waves to determine the direction in which a radio station or an object is located, a rescue hoist for winch operations, a 4-Axis autopilot capable of holding search patterns, and a single or three patient stretcher configuration.

This Bell 412 is configured with an external rescue hoist.

The helicopters are also equipped with a loud hailer to deliver amplified messages outside the aircraft, a cargo hook with Bambi Bucket provision for firefighting activities, two machine gun installations if required, and fast rope/rappelling kits.

On the other hand, unlike their counterparts, the Bell 412s are night vision capable. The Bell helicopters are also IFR-capable and are equipped with GPS (Skymap IIIC), weather radar (Primus 700), marine radio (Wulfsberg C-1000), and police radio. Rescue equipment includes a Direction-Finding Homing Device (Becker-517), life rafts, life vests, and a rescue hoist (internal on CP-2 whilst external on CP-4). Both Bell 412s are also equipped with a loud hailer, Bambi bucket provision, and machine gun installations.

Pilot Training

Pilots are trained regularly in the following academies:

- Police Academy
- Flight safety international until 2004
- Oxford Aviation Academy simulator for re-evaluation of pilots at the main task of the unit and,
- emergency procedures
- AgustaWestland Italy
- Cobham (FBHeliservices)
- RAF Shawbury, UK
- Helo Dunker with the Hellenic Navy, which is a course that provides the crew with the skills and confidence to successfully and safely remove themselves from a helicopter that is submerged in water.
- Crew Resource Management (CRM)

Engineers / technicians Training

Engineers/technicians are trained periodically in various organizations and companies to maintain a high level of maintenance and Flight Safety:

- Police Academy
- Bell Textron
- Pratt and Whitney in Germany and Canada
- Hellenic Aerospace Industry
- Augusta Westland in Italy
- Helo Dunker with the Hellenic Navy
- Crew Resource Management (CRM)

The Special Operations Team (SOT) undergoes SWAT Training, Helo Dunker training with the Hellenic Navy, and other training activities with the Police Academy and Hellenic Air Force.

Apart from such training activities, the C.P.A.U participates in several yearly exercises, one which stands out in particular, is the 'NEMESIS' exercise. On 3 November 2021, 'NEMESIS 2021' was conducted within sea plots 1, 2, 8, and 9 of the Exclusive Economic Zone of the Republic of Cyprus. Aeronautical units and personnel from Cyprus, Greece, France, the UK, the USA, Israel, Italy, and Egypt, along with six private companies participated in the exercise.

The exercise aims to prepare all the involved in the proper confrontation of any distress situation that may occur on a hydrocarbon platform. The overall coordination of the exercise was under the JRCC, in collaboration with the Deputy Ministry of Shipping, the National Guard, the Cyprus Police, and the Department of Fisheries. The exercise included counter-terrorism scenarios on a hydrocarbon platform, boarding operations on suspicious boats, ship firefighting, air-evacuation of trapped and injured persons, mass rescue operations as a result of the abandonment of the platform, as well as anti-pollution operations.

The Cyprus Police Aviation Unit operates two Agusta Westlland AW139 helicopters.

Bell 412 with the registration CP-4 is one of two helicopters of this type that serve with the Cyprus Police Aviation Unit.

NORTH MACEDONIAN 'FROGFROOTS' TO UKRAINE

TEXT: IGOR BOZINOVSKI
PHOTOS: IGOR BOZINOVSKI AND DRAGAN CVETIC

North Macedonia donated its four Sukhoi Su-25 *Frogfoot* twin-engine ground attack jets to Ukraine, North Macedonian media reported on 4 August. The North Macedonia Ministry of Defence (MoD) did not deny nor confirm this information and also avoided commenting on whether the aircraft were donated together with related weapons, reserve engines, spare parts, and tools.

In a short statement, the MoD said that "The exact details of all three [Macedonian government] decisions [for the donation of weapons and military equipment to Ukraine], their content and explanation will be declassified and transparently published. [...] The decisions made so far do not affect the combat readiness of our army", the MoD statement concludes.

The information about the donation of Su-25s to Ukraine came days after MoD confirmed that it is donating Macedonian T-72 Main Battle Tanks (MBTs) to Ukraine and some two months after North Macedonia's left-wing nationalist and eurosceptic political party Lect (Levica) informed that whistleblowers, officers of the Army of the Republic of North Macedonia (Armija na Republika Severna Makedonija, ARSM), informed that Ukrainian specialists were seen at Petrovec AB near Skopje, checking and preparing the Su-25s for transport.

ARSM has 31 T-72A MBTs that were acquired second-hand from Ukraine in the summer of 2001. Stationed at Ćojlija barracks, near Skopje, these are the highest caliber weapons in North Macedonia's military inventory.

Moscow has denounced as a gross mistake the decision by North Macedonia to hand over T-72 tanks to Ukraine, saying it would only foster the Kyiv regime's criminal activity, Russian Foreign Ministry Spokeswoman Maria Zakharova said on 2 August. "Being driven by the spirit of its allegiance to NATO, Skopje has been playing a role in pumping Ukraine with weapons, thus fostering the Kyiv regime's criminal activity against Donbas civilians," Zakharova emphasized.

Macedonian Ministry of Foreign Affairs (MFA) and MoD responded to Zakharova by informing them that North Macedonia is a sovereign state that makes its decisions independently, guided by the principles of respect for international law. "From the very beginning, North Macedonia condemned the military intervention in Ukraine and stood in support of the

Su-25 *Frogfoot*s in open storage at Petrovec AB in May 2012

territorial integrity, sovereignty, and independence of Ukraine", the MFA and MoD announced in a joint statement.

North Macedonia's three single-seat Su-25 *Frogfoot A*s and a single twin-seat Su-25UB *Frogfoot B* ground attack jets were acquired second-hand from Ukraine for a total price of USD 8.0 million. Being former-Belarusian jets that passed a general overhaul at the Baranovichi-based 558 Aircraft Repair Plant (558 ARZ), these planes landed on Macedonian soil on 20 June 2001. They were in use by the Macedonian Air Force until withdrawn from service on 1 March 2004. Their R-195 engines were started and the ground systems were checked weekly before the aircraft were definitely abandoned and consequently erased from ARSM's inventory in October 2005. The follow-on repeated attempts to sell the planes brought no results with the most serious attempt being to sell them to Georgia in 2005 in an effort that was diplomatically blocked by Russia.

The last serious effort to restore Macedonian Su-25s was in late 2011. The government in Skopje seriously considered returning them to operational condition. However, experts found that it would be economically illogical to invest in airframes that have been grounded and kept in open storage for many years, exposed to severe summer and winter weather. Thus, the most-potent aircraft in the history of the North Macedonia Air Force remained grounded at Petrovec AB and in open storage making them difficult to return in operational use and potentially being good only as a source of spare parts.

Based on the publicly available details on the Macedonian military inventory, besides the T-72s and Su-25s, of interest to Ukraine could also be the following ARSM's Soviet-era assets: BM-21 Grad 122 mm multiple rocket launchers, M-30 122 mm howitzers, various 60/82/120 mm mortars, BTR-70/80 wheeled armored personnel carriers, BMP-2 tracked infantry fighting vehicles, MT-LB tracked auxiliary armored vehicles, Mi-24 attack helicopters, Strela-10M self-propelled plus Strela 2M and Igla man-portable air defense systems, various small arms as well as ammunition, components and spare parts for the mentioned weapons.

Su-25 *Frogfoot* 122 is one of three single-seat Su-25 *Frogfoot*s the North Macedonian Air Brigade had in its inventory. All Su-25s are in open storage at Petrovec AB.

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1 The Su-25 *Frogfoot* could be loaded with a wide range of air-to-ground ammunitions.
2 Su-25 *Frogfoot A* (May 2012)
3 Su-25 *Frogfoot A* (July 2014)
4 Su-25 *Frogfoot B* (July 2014)
5 Su-25 *Frogfoot B* (March 2013)
6 Su-25 *Frogfoot B* (May 2006)

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